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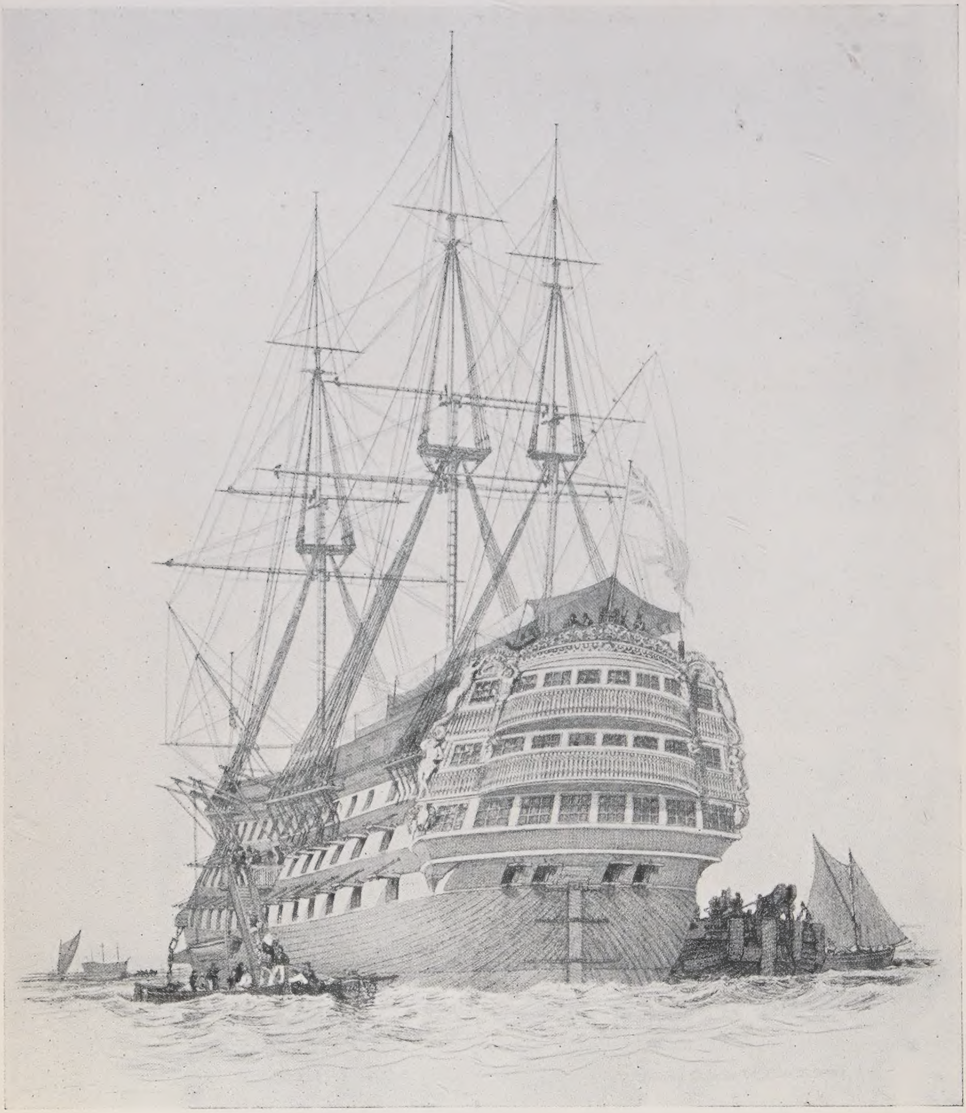
THE

Old Wooden Walls:

Their Construction, Equipment, etc.

Printed in Great Britain by The Carlton Press, Chesham, Bucks.



E. W. Cooke, 1828.

H.M.S. "PRINCE." FIRST RATE, 110 GUNS.
(WITH THE STERN BALCONIES AS BUILT BEFORE THE CLOSE STERNS WERE INTRODUCED.)

In Portsmouth Harbour. *Jury Rigged.*

THE

Old Wooden Walls:

Their Construction, Equipment, etc.

Being an abridged Edition of

FALCONER'S
Celebrated Marine Dictionary.

Edited and Arranged,
with an Introduction,
by
CLAUDE S. GILL
(*Certified Master Mariner*).

**With Thirty-one Folding
and other Plates.**

London
W. & G. FOYLE, Ltd.
1930

EDITOR'S INTRODUCTION.

TO the average reader, the re-issue of a work which deals with ships as they were at the beginning of last century may appear to serve no useful purpose now, and calls for some explanation.

There are some, to whom the sailing ship is merely a somewhat complicated obsolete craft whose *raison d'être*, the carriage of merchandise and incidentally the earning of dividends, is performed much more efficiently and profitably by her successor—the steamer. Of such people, we may conclude that the influence of the environment in which they have the misfortune to live has proved too strong for them, and the romance of history finds no place in their lives.

Others there are, however, who recognise in the sailing ship, as she appeared at the end of a process of evolution extending over some 8,000 or 10,000 years, the most beautiful creation the human mind has conceived. In the design of her graceful lines, and all the intricacies of her cleverly planned structure, there is something akin to the handiwork of Nature herself; she seems to be endowed with an intangible *something* quite apart from her material make-up—a personality or soul, entirely wanting in the steamer. A comparison between the old and the new is as incongruous as that between the stately swan and the ungainly elephant. Far be it from me to belittle the brilliant achievements of those whose industry and resource have collectively produced that highly useful vessel, the modern liner, with her vast carrying capacity, palatial accommodation, powerful engines, and enormous speed, but it is sad to reflect that the

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price of maritime progress is an utter disregard for the dignified beauty so prominently displayed in her predecessor. The steam vessel has been evolved from her most elementary form to her present marvellous state of efficiency and reliability in little more than a hundred years—a fact of which engineers might well be proud—further, she has practically succeeded in transforming the sailing ship from a paying commercial proposition into a museum exhibit, and the "iron men" who manned her will soon all have passed to Davy Jones.

Literature and history afford ample evidence that we are a nation of sea-lovers. The insistent "Call of the Sea" is an hereditary one which makes itself heard in field, office, and factory, and there is a great and ever-growing body of people in all walks of life who feel the urge to give it material expression, many choosing as their hobby the building of ship models. A reproduction of the steamer, however true to life, suggests the noisome hustle of the shipyard, the oppressive heat of her stoke-hold, or the smoke and fumes with which she pollutes the air we breathe; there is little about her that leads one's thoughts towards the wholesome freshness of the sea. An accurate model of the sailing ship, on the other hand, breathes the salt tang of the spindrift, and suggests the unspoiled naturalness of the ocean, a fit symbol indeed of the long centuries of maritime history which formed the solid foundations for the building of our great Empire. It is the "Old Wooden Walls," therefore, about which detailed information is sought with increasing interest. Lacking the evidence of the "old salts" who had first-hand knowledge of the craft, the student must perforce rely upon the literature which remains to remind us of their greatness.

Ever since it was realised that the sailing ship had been dealt her death-blow, books on her construction, history, and equipment have been in greater demand all over the world, the result being that they have become increasingly scarce, the soaring prices placing them beyond the reach of those of moderate means. In recent years, especially, our American friends have shown extraordinary activity in their search for these treasures, and it would seem that we, whose representative literature should be worthy of our traditions and the maritime supremacy we have enjoyed, will soon have to take second place.

It is impossible to describe, within the limits of one volume, the characteristics of the hundreds of types of sailing craft that have existed since she first appeared in Egypt thousands of years ago, that is if any close attention be paid to the details so essential to the student. Apart from the encyclopædic nature of such a treatise, there are serious gaps in our records which have not yet been filled. It is therefore far more satisfactory to confine oneself to a certain period during which every detail is known beyond doubt, for the task of building a really presentable model is not to be lightly undertaken, and insufficient data which results in an appeal to the imagination is a frequent source of failure. If a model is to withstand the sharp eyes of the critic, precision must be the aim throughout ; books, prints, and pictures have to be examined and compared minutely, for too much reliance cannot be placed on books unless written by a reputable authority, whilst artists are too fond of shelving accuracy of detail in favour of pictorial effect.

Amongst the profusion of works dealing with the subject of naval architecture and the equipment of ships, Falconer's *Marine Dictionary*, for his period, stands out pre-eminently as the best all-round treatise, and its value is enhanced by the writer's passionate love of ships and the sea, as revealed in the beautiful poems that bear his name. The first edition of this Dictionary appeared in 1769, and the second in 1815, revised and very much enlarged by William Burney, LL.D., at that time master of the Naval Academy at Gosport. Although he adhered carefully to the plan of the original, Dr. Burney acquired much additional data from other authoritative works, including Steel's *Elements and Practice of Rigging and Seamanship*, Darcy Lever's *Young Sea Officer's Sheet Anchor*, and Norie's *Mariner's Encyclopædia*, all of them much sought after books, obtainable only at a high premium.

It is from the second edition that most of the articles and plates in this issue have been taken; in many cases they are identical with the original edition, but sometimes give more detail. Where it was considered more informative to take extracts from the first edition, a note to that effect has been embodied in the text, or appended to the plate.

The Editor's rôle has been a small one; he has merely modernised the language, corrected obvious misprints, re-arranged the plates, and chosen only those articles from the Dictionary that have some direct bearing on the construction and equipment of ships. The other articles, describing astronomical and navigational instruments and methods, rates of pay, mess allowance, order of sailing, etc., etc., are of interest from an historical point of view, but fall outside the scope of this work. It will be noticed that the arrangement of subjects conforms to the original plan and is alphabetical, thus the truck may have been fitted before the keel, as it were. This method has the advantage of easy reference, but of course does not describe the sequence to be followed by the ship modeller. The plates, drawn to scale, and various tables of dimensions, should prove invaluable, whilst a short bibliography is included at the end for the benefit of those who wish to make further study. Of the books particularly devoted to modelling, that in three volumes by Captain E. Armitage McCann is to be strongly recommended. A pioneer work of its kind, it is very comprehensive, and was written by a sailor with many years practical experience in sail, who has since "swallowed the anchor" and turned his skilled hand to the making of some exceedingly fine models—incidently Captain McCann was the founder of the Ship Model Makers' Club of New York which now has a membership of about two thousand.

In order to give a general idea of the ships and different views of a ship as they actually appeared, several very famous engravings reproduced from E. W. Cooke's *Plates of Shipping and Craft* (1828) have been inserted in different parts of the text.

All credit for the compilation of this treatise is due to those who have long since passed away, and the Editor hopes, as no doubt they did, that it will be valued by the student of nautical history, stimulate interest in a fascinating subject, and enable the ship modeller to produce work worthy of the splendid traditions of the sea.

BIOGRAPHICAL MEMOIR OF WILLIAM FALCONER.

WILLIAM FALCONER was born about the year 1730, and was the son of a poor but industrious barber of Edinburgh. Strangely enough, all his children, with the exception of William, were either deaf or dumb and, as evidence of their humble circumstances, two of them died in the poor house at Edinburgh.

In Scotland poverty is never depressed by ignorance, or want of religious principles; Falconer, therefore, despite his modest upbringing, had a proper bias given to his mind from the first dawn of its intellectual powers. It was this bias, impelled by the energy of his genius, which enabled him, without any further education than what was acquired at the public schools which were established in every parish in that country, to reach the goal of literary fame.

At an early age, he joined a merchant vessel at Leith and served his apprenticeship on her; soon afterwards he was on board a man-of-war in the position of servant to Campbell, the author of *Lexiphanes* and a purser in the navy. This officer, we gather, found great pleasure in educating the young seaman, for in after years when Falconer had attained celebrity, he proudly boasted of his scholar, and we may suppose that the latter profited considerably under this able master and critic. Falconer began to exercise his gifts at a very early age, and when only twenty-one wrote *A Poem, Sacred to the Memory of Frederick Prince of Wales*, which was published in Edinburgh. The confined nature of this poem afforded him little opportunity to display his imaginative and descriptive abilities, and it received but slight recognition, yet there was that harmonious and effortless versification in it, which gave indication of a rising genius.

On the recommendation of some kind friend, probably his old master, Campbell, he was promoted to the quarter-deck about the year 1757. It is recorded in the fifth volume of the *Naval Chronicle*, under the biographical memoir of Commodore Locker, that Falconer, whilst serving as midshipman on board the *Ramillies* with Captain Taylor, was wrecked in that ship on the 15th February, 1760. On the 5th February, it appears, Admiral Boscawen, in the *Royal William*, sailed from Plymouth with six sail of the line to take command of the fleet in Quiberon Bay. Shortly afterwards, the wind shifted to the westward and increased to a violent gale, which dispersed the squadron. The *Ramillies* was so much shattered that Captain Taylor bore away for Plymouth; on the 15th, coming up channel during hazy weather, he sighted Bolt Head, but mistaking it for Ram Head, he stood on until the ship was so close in shore that it was impossible to weather it. The Captain ordered the masts to be cut away, and let go the anchors, but the storm was so severe that the cables parted and the ship was driven on to the rocks and smashed to pieces. Of the 734 men who made up the crew, 25 only, including Falconer, the midshipman, were saved, by jumping from the stern to the rocks.

During the years he served on board the *Ramillies*, Falconer contributed several anonymous pieces to the *Gentleman's Magazine*; amongst others, lines *On the*

Uncommon Scarcity of Poetry in that publication, 1756; *The Chaplain's Petition to the Lieutenants of the Ward-Room*, 1758; *Verses Addressed to a Lady*, dated 25th November, 1758, *Ramillies* in the Bay of Biscay; *The Description of a Ninety-gun Ship*, 1759; and *The Loss of the Ramillies*, 1760. He also wrote *The Midshipman*, an excellent little poem which has since lost its name in the more technical one of *Orlop*, or the deck immediately over the hold, on which the berths of the midshipmen were placed. Many other poems and sea-songs have been attributed to his pen, but as he nearly always adopted a pseudonym, we lack definite proof.

Soon after being wrecked in the *Ramillies*, Falconer left the navy and returned to the merchant service as mate of the *Britannia*, a vessel employed in the Levant trade. His shipmates, with their strange superstitions, must have regarded him as a " Jonah," for his whole life appears to have been dogged by misfortune, and the *Britannia* was wrecked near Cape Colonna. It is to this tragedy, however, that we are indebted for what has been recognised as one of the finest poems in the English language, entitled *The Shipwreck*, published in 1762, in which the author feelingly describes the dangers he actually experienced. It contains the most beautiful marine descriptions, and every-day sights to the sailor, such as the prospect of a shore, a shoal of dolphin, a water-spout, the method of taking an azimuth, and of working the ship, are portrayed in verse with an amazing minuteness which embraces even the technical terms. It is impossible to read the circumstantial account of the unfortunate end of the ship's crew without being deeply affected by the tale, and charmed with the manner of its relation. Contemporary critics asserted that this poem was of inestimable value to the country "since it contains within itself the rudiments of navigation, if not sufficient to form a complete seaman, it may certainly be considered the grammar of his professional science. Many experienced officers have declared that the rules and maxims delivered in this poem, for the conduct of a ship in the most perilous emergency, form the best, indeed the only, opinions which a skilled man should adopt. We possess, therefore, a poem, not only eminent for its sublimity and pathos, but for an harmonious poetic assemblage of technical terms and maxims used in navigation, which a young sailor may easily commit to memory; and also, with these, such scientific principles as will enable him to lay a solid foundation for his future professional skill and judgement."

The novelty and interest of this poem, which was inscribed to Edward Duke of York, not only procured a favourable reception from the public, but established the author's fame as a poet. The Royal Duke, anxious to honour Falconer, recommended him to return to the navy where he might be able to serve him; accordingly he was rated a midshipman on board Sir Edward Hawke's ship, the *Royal George*. When this ship paid off, he had not completed that time of service which was necessary to qualify him for a lieutenant's commission, and consequently, in the year 1763, through the interest of his patron, he was appointed purser of the 32-gun frigate *Glory*, afterwards called the *Apollo*. Soon after obtaining this appointment, Falconer married a young lady of the name of Hicks, daughter of the surgeon of Sheerness yard. The *Glory* was laid up at Chatham, and through the influence of his friends, the captain's cabin was fitted up for him with every comfort and convenience in order that he might enjoy his literary pursuits without interruption or expense.

In this semi-retirement he compiled his famous *Dictionary of the Marine*, a work which appears to have engaged his attention for some five or six years. This alone would have immortalised his name had not his poetical reputation stood foremost, and its great utility and accuracy was acknowledged by Sir Edward Hawke and many other professional men, both English and French.

The death of the Duke of York was a severe blow to Falconer, for literary fame was not such a valuable asset in those days, although he derived some small emolument from writing in the *Critical Review* and other periodical publications.

From the *Glory*, he was appointed to the *Swiftsure* at the end of 1767, and when the *Marine Dictionary* was finally published in 1769, he was transferred to the *Aurora*, which vessel was then ordered to carry out to India three officers employed in the Honourable East India Company's service. The ship called at the Cape of Good Hope, but was lost during the course of the voyage. A native who was examined before the East India Directors in 1773, that is four years after the loss of the vessel, affirmed that he was one of five persons who had been saved from the wreck of the *Aurora*; that the said frigate had been cast away on a reef off Mocoa, and that he was two years on an island before he was at length picked up by a passing ship.

Thus perished poor Falconer in the bosom of the waves, the occasional fury of which, and consequent disasters, he so forcibly and elegantly described, leaving behind him works to perpetuate his name, more durable, and far more honourable than any the artist's hand could erect, works which afford ample evidence of his keen nautical ability combined with remarkable poetical talent, in proof of which we may quote the following portion of *The Shipwreck* describing the sailing of the *Britannia* from Candia :

Thrice with shrill note the boatswain's whistle rung.
All hands unmoor ! proclaims a boisterous cry :
All hands unmoor ! the cavern'd rocks reply !
Rous'd from repose, aloft the sailor swarm,
And with their levers soon the windlass arm.
The order given, up springing with a bound,
They lodge the bars, and wheel their engine round :
At every turn the clanging pawls resound.
Uptorn reluctant from its oozy cave,
The ponderous anchor rises o'er the wave.
Along their slippery masts the yards ascend,
And high in air the canvas wings extend :
Redoubling cords the lofty canvas guide,
And thro' inextricable mazes glide.
The lunar rays with long reflection gleam,
To light the vessel o'er the silver stream :
Along the glassy plane serene she glides,
While azure radiance trembles on her sides.
From east to north the transient breezes play,
And in the Egyptian quarter soon decay.
A calm ensues ; they dread the adjacent shore ;
The boats with rowers arm'd are sent before :
With cordage fastened to the lofty prow,
Aloof to sea the stately ship they tow.
The nervous crew their sweeping oars extend,
And pealing shouts the shore of Candia rend.
Success attends their skill ; the danger's o'er,
The port is doubled, and beheld no more.
    Now Morn, her lamp pale glimmering on the sight,
Scatter'd before her van reluctant Night.
She comes not in refulgent pomp array'd,
But sternly frowning, wrapt in sullen shade.
Above incumbent vapours, Ida's height,
Tremendous rock ! emerges on the sight.
North-east the guardian isle of Scandia lies,
And westward Freschin's woody capes arise.
    With winning postures, now the wanton sails
Spread all their snares to charm the inconstant gales ;
The swelling stud sails now their wings extend,
Then stay sails sidelong to the breeze ascend :

While all to court the wandering breeze are plac'd ;
With yards now thwarting, now obliquely brac'd.
The dim horizon lowering vapours shroud,
And blot the sun, yet struggling in the cloud :
Thro' the wide atmosphere, condens'd with haze,
His glaring orb emits a sanguine glaze.
The pilots now their rules of art apply,
The mystic needle's devious aim to try.
The compass plac'd to catch the rising ray,
The quadrant's shadow studious they survey ;
Along the arch the gradual index slides,
While Phoebus down the vertic circle glides.
Now, seen on ocean's utmost verge to swim.
He sweeps it vibrant with his nether limb.
Their sage experience thus explores the height
And polar distance of the source of light :
Then thro' the chiliards triple maze, they trace
Th' analogy that proves the magnet's place.
The wayward steel, to truth thus reconcil'd
No more th' attentive pilot's eye beguil'd.
The natives while the ship departs the land,
Ashore with admiration gazing stand.
Majestically slow, before the breeze,
In silent pomp she marches on the seas.
Her milk white bottom casts a softer gleam,
While trembling thro' the green translucent stream.
The wales, that close above in contrast shone,
Clasp the long fabric with a jetty zone.
Britannia, riding awful on the prow,
Gaz'd o'er the vassal wave that roll'd below :
Where'er she moved, the vassal waves were seen
To yield obsequious, and confess their queen.
Th' imperial trident grac'd her dexter hand,
Of power to rule the surge, like Moses' wand,
Th' eternal empire of the main to keep,
And guide her squadrons o'er the trembling deep.
Her left propitious bore a mystic shield,
Around whose margin rolls the wat'ry field.
There her bold Genius, in his floating car,
O'er the wild billows hurls the storm of war ;
And lo ! the beasts, that oft with jealous rage
In bloody combat met, from age to age,
Fam'd into Union, yok'd in friendship's chain,
Draw his proud chariot round the vanquish'd main,
From the broad margin to the center grew
Shelves, rocks, and whirlpools, hideous to the view !
Th' immortal shield from Neptune she receiv'd,
When first her head above the waters heav'd,
Loose floated o'er her limbs an azure vest ;
A figur'd scutcheon glitter'd on her breast :

There, from one parent-foil, for ever young,
The blooming rose and hardy thistle sprung.
Around her head an oaken wreath was seen,
Inwove with laurels of unfading green.
Such was the sculptur'd prow—from van to rear,
Th' artillery frown'd, a black tremendous tier!
Embalm'd with orient gum above the wave,
The swelling sides a yellow radiance gave.
On the broad stern a pencil warm and bold,
That never servile rules of art controll'd,
An allegoric tale on high portray'd;
There a young hero; here a royal maid.

PREFACE TO THE FIRST EDITION.

THE following work has engaged my utmost application for some years. Several performances on the same subject have already appeared; as Sir H. Manwaring's *Seaman's Dictionary*; Boteler's *Sea Dialogues*; Guillet's *Gentleman's Dictionary*, and Blanckley's *Naval Expositor*, etc. Far from exhibiting an enlarged and comprehensive view of naval affairs, these productions are extremely imperfect, according to the very circumscribed plan which their authors have adopted. There are besides, the *Dictionaire de Marine* of M. Aubin, published in Holland; and that of M. Saverien, published in France. These are indeed voluminous, but very deficient in the most necessary articles. Besides a circumstantial detail of the local economy of different marine departments, they are swelled out with astronomy, navigation, hydrography, natural history, etc., all of which are abundantly better treated in other compositions. Of the machinery of a ship; the disposition of the rigging on her masts and yards; and the comparative force of her different mechanical powers, their accounts however are often vague, perplexed, and unintelligible. With regard to her internal government in action; to the general regulations of the line of battle; and to the principle movements in sailing, they are almost totally silent. Had any of these works been executed with tolerable success, it might have rendered mine unnecessary; or probably have introduced it in the form of a translation.

I acknowledge with great pleasure the advantages I have derived in the prosecution of this work, from several authors of distinguished reputation; in reality however, none of those above-mentioned is of the number. In that part which is dedicated to the theory and art of shipbuilding, I owe considerable obligations to the ingenious M. Du Hamel. The principal pieces used in the construction of a ship together with their combination and disposition, are copiously and accurately described in his *Elements of Naval Architecture*: and his general account of the art itself is perspicuous and comprehensive. Many of his explanations I have therefore implicitly adopted.

In treating of the artillery, I have occasionally consulted Le Blond, Muller, and Robins, besides selecting some valuable materials from the manuscripts of officers of long experience and established reputation in that service. Whatever relates to the rigging, sails, machinery, and movements of a ship; or to the practice of naval war, is generally drawn from my own observations; unless where the author is quoted.

As there is an abundance of books professedly written on astronomy, and the theory of navigation, I have totally omitted the terms of the former, as foreign to my plan; and slightly passed over the latter: because no reader could acquire sufficient idea of those sciences from so partial a description. Many of the least important parts of a ship, as well as of her rigging, are very generally defined. To explain the track of every particular rope, through its different channels, would be equally useless and unintelligible to a land reader: to mariners it were superfluous: and even the youth who are trained to the sea, would reap little advantage from it; because their situation affords them much better opportunities of making these minute discoveries.

As the plates of this publication were intended to illustrate the various objects to which they refer, they are little ornamented; but have in general the recommendation of simplicity and geometrical truth. In this part I have been particularly favoured with many original drawings, which are usually considered amongst the inaccessible arcana of shipbuilding. They are much more numerous, useful, and correct, than what has hitherto appeared in any work of the kind. In fine, I have endeavoured, to the best of my judgement, to retrench the superfluities, and supply the deficiencies of former writers on the same subject, as well as to digest and methodise whatever appeared loose or inaccurate therein.

This undertaking was first suggested to me by my worthy and ingenious friend George Lewis Scott, Esq.; who considered it as a work of extensive utility. indeed, in a country whose principal sources of strength are derived from the superiority of her marine, it is evidently wanted. I have the pleasure also to know that Sir Edward Hawke, and several officers of respectable abilities in our navy, are of the same opinion. To this may be added, what the celebrated M. Du Hamel lately observed, in a letter to me, "*Ce livre manquoit absolument; celui qui a été imprimé en Hollande, et qui a eu un débit considerable, est très imparfait: celui de M. Saverien est encore plus mauvais.*" I mention this expressly, because some sea-officers have considered the work unnecessary. It is however submitted, with all possible deference, to superior judges; to men of science and letters, who know the difficulty of explaining the parts of a mechanical system, when the readers are unacquainted with the subject.

William Falconer.

1769.

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A

ACORN; a little ornamental piece of wood, fashioned like a cone, and fixed on the uppermost point of the spindle, above the vane, on the mast-head. It was used to keep the vane from being blown off from the spindle in a strong breeze when the ship heeled over. See Plate 1, Fig. 6, where *a* represents the acorn, *b* the vane and stock, *c* the spindle, and *d* the mast-head.

ANCHOR; a large heavy iron instrument, with a double hook at one end, and a ring at the other, by which it was fastened to a cable, and dropped from a ship to the bottom of the sea, where, taking its hold, it kept her in position and prevented her from being driven away by the action of the wind or tide.

An anchor was so contrived, by the construction of its parts, as both to sink into the ground when it reached the bottom, and to bear a very heavy strain before it could be loosened or dislodged. It was composed of a shank, a stock, a ring, and two arms with their flukes or palms. The stock served to guide the flukes in a direction perpendicular to the surface of the ground; so that one of them sank into it by its own weight, and was preserved steadily in that position by the stock, which, together with the shank, lay flat on the bottom. (See Plate 1, Fig. 7).

That the form of this very useful instrument may be more clearly understood, we shall describe it as composed of four parts, the ring, the shank, the arms, and the stock. (See Plate 1, Figs. 1, 3 and 5.)

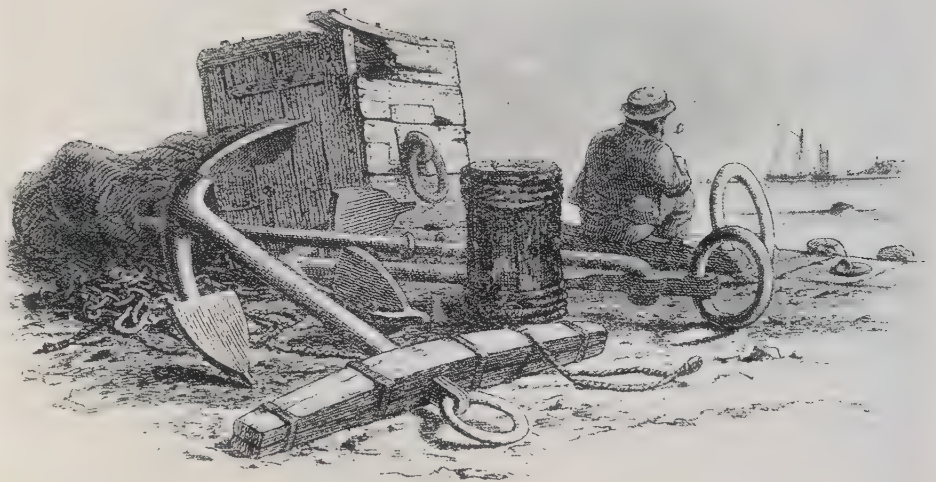
The arms consisted of palms, or flukes, and the bill.

The palms were the broad plates, of a triangular form, at nearly the extremity of the arms; and the bills were the sharp points at the very extremity of the arms.

The throat of the arms was the rounded angular point where the arms were joined to the shank. A distance equal to that between the throat of one arm and its bill was marked on the shank from the place where it joined the arms, and was called the trend; the crown was the place where the arms were joined to the shank; the small round was the diameter of the shank at its smallest part, which was near the square part, where the stock was fixed; the stock was a beam of wood fixed on the extremity of the shank, at right angles to the plane passing through the arms.

The shank of anchors consisted of four square bars of iron, encircled by a number of lesser bars of the same lengths, which were again surrounded by other bars like the arch-stones of a bridge. The method of building the shank will be understood from the section of it, which is represented in Fig. 4.

The shank tapered from the extremity where the arms were fixed, to the other extremity which carried the stock, so that the difference between these diameters was from 1½ inches in small ones, to 3 inches in large ones. The extremity to which the stock was fixed, was of square form, of the same size as the trend, and haunched into the small round, one-sixth the length of the shank. Through this square part was punched a hole for the ring, at a distance of one and a half times the thickness of the ring from the upper extremity of the square part. Between this hole and the lower extremity of the square part, were



E. W. Cooke, 1828.

ANCHORS, ETC.

two small prominences (*a b*, in Fig. 3) called nuts, raised from the solid iron, for the purpose of securing the stock in its proper position.

The arms were made in the same way as the shank. They were rounded and flatted on the different sides, so as to resemble the shank, and were of the same diameter as the shank at the throat and small round.

The arms were rounded between the throat and the palms, which were nearly in the middle of the arms. The outer side of the arm was made straight from the rounded part or haunch to the snape or bill, and there kept to half the substance of the inner part. The snape, which was nearly one-fourth the breadth of the palm, resembled the bill of a duck. The interior part of the arm was made nearly a straight line from the throat to the bill. A line drawn from the trend to the point of the bill formed an angle of nearly sixty degrees with the shank.

The palms or flukes were two thick plates of iron, nearly an isosceles triangle. The sides of them, which were a little curved, were from one and a quarter to one and a half inches longer than their base, and the highest points of the curves about the same distance, from a straight line drawn from the extremity of the base to the vertex of the triangle. The base was straight ; the inner flat surface was a little curved in its breadth, but was a straight line in its length. (See Fig. 2).

The stock of an anchor consisted of two beams of oak firmly united by iron bolts and hoops, two hoops being on each side of the middle, and one near each extremity. The length of the stock was equal to the length of the shank, and half the diameter of the ring. Its breadth and thickness in the middle were each one-twelfth of its length. At the extremities of the stock, the breadth and thickness was one twenty-fourth of its length. The upper surface of the stock next the ring was always straight, or formed one continued plane. (See Fig. 5). The under surface was composed of three planes. The central one extended to half the breadth of the stock, on each side of the middle, and from that place the surface descended to each extremity.

Figs. 1, 2 and 3, in Plate 1, are drawn to a scale of 4/10ths of an inch to a foot, from an anchor of 80 cwt. Fig. 4 is a section of the bars, as laid together in the smallest hoop of the shank for an anchor of 80 cwt., but is drawn to a scale of one inch to a foot. Fig. 5 is drawn to a different scale merely to show the form of the stock.

The largest anchors in use in his Majesty's ships in 1815 weighed 90 cwts. Their dimensions were as follow: Length of shank, 19 ft. 11 ins.; length of flukes, 6 ft. 7$\frac{5}{8}$ ins.; breadth of the palms, 3 ft. 3$\frac{5}{8}$ ins.; thickness of the palms, 3$\frac{3}{4}$ ins.; size of the trend, 10$\frac{1}{4}$ ins.; size of small round, 8$\frac{1}{2}$ ins.; outer diameter of the ring, 3 ft. 3$\frac{5}{8}$ ins.; thickness of the ring, 4$\frac{3}{8}$ ins.

The names of the anchors were:

The Sheet Anchor, which was the largest and strongest.

The best Bower Anchor, and the small Bower Anchor, which were a little different in size, and took their names from the position in which they were placed, being carried in the bows of the ship.

The Stream Anchor was smaller than the preceding: and

The Kedge Anchor which was the smallest of all.

With the exception of sloops and gun brigs, all vessels were required to carry 4 Bower Anchors, 1 Stream Anchor, and 1 Kedge Anchor; while the larger vessels carried an additional Kedge Anchor, which was much smaller.

APRON; in shipbuilding, was a piece of curved timber, fixed behind the lower part of the stem, just above the foremost end of the keel. It is represented by H, in Plate 7, Fig. 1.

The apron conformed exactly to the shape of the stem, so that when the convexity of the former was applied to the concavity of the latter, it formed one solid piece, which served to fortify the stem, and give it a firmer connection with the keel.

As the apron was composed of two pieces scarfed together, and used to support the scarf of the stem, it was necessary that the scarfs were made some distance apart. The apron was of the same thickness as the heel of the stem; but this thickness was equal throughout. Sometimes the piece immediately under the apron formed a curve, of which the horizontal part covered the dead-wood, whilst the vertical part corresponded with the inside of the stem, to which it was fayed, making the commencement of the apron.

B

BACK OF THE STERN-POST; an additional piece fitted behind the stern-post. The difficulty of procuring a stern-post of sufficient breadth in one piece introduced this practice: it was strongly bolted to it, and the braces or gudgeons which supported the rudder were fixed to it. It was tenanted to the keel. See the article Stern-post.

BACK-STAYS ; long ropes extending from the top-mast-heads to the starboard and port sides of a ship, where they were farther extended to the channels ; they were used to second the efforts of the shrouds in supporting the masts. There were also back-stays for the top-gallant-masts in large ships, which were fixed in the same manner as those of the topmasts. A pair of back-stays was usually formed of one rope, which was doubled in the middle, and fastened there so as to form an eye, which was passed over the Mast-head, whence the two ends came down, and were stretched to the channels by dead-eyes and lanyards. See Plate 1, Fig. 15 ; Plate 3, Fig. 21 ; and Plate 6, Fig. 1 ; also the Article Dead-eyes.

BACK-STAY STOOL ; a short piece of plank, fitted for the security of the dead-eyes and chains for the back-stays, though sometimes the channels were left long enough at the after end for the back-stays to be fitted to them.

BADGE ; in naval architecture, was a sort of ornament, placed on the outside of small ships very near the stern, containing either a window, or an imitation of one ; it was commonly decorated with marine figures, martial instruments, or similar emblems. See the article Quarter.

BAG-REEF ; a fourth or lower reef sometimes used in sails in the Royal Navy.

BALCONY ; the projecting gallery in the stern of old large ships, either for ornament or convenience of the captain's cabin. In ships built after 1800 or thereabouts it was nearly always thrown into the cabin. See Plate 5, Fig. 1, and Plate 14.

BALUSTERS; small columns or turned pillars of wood placed round the balcony in the stern, and also in the quarter-gallery of large ships.

BANDS; strips of canvas strongly sewn across the sails where extra strength was required, as the reef-bands, etc.

BARK, or Barque; a general name given to small ships: it was, however, peculiarly appropriated by seamen to those which carried three masts without a mizzen-topsail. Many mariners applied this distinction to a broad-sterned ship without a figure-head.

BARRICADE; a strong wooden rail, supported by stanchions, extending across the fore part of the quarter-deck.

Capstan BARS; were large thick wooden bars, the ends of which were fitted in the holes in the drum-head of the capstan, by which it was turned round the spindle.

BEAK-HEAD; a small platform at the fore part of the upper deck in large ships; generally placed the same height from the deck as the port-sills, occasionally for the use of a gun, but chiefly for the convenience of the men. At the after part of the beak-head was a bulk-head, which enclosed the forecastle. This name was usually appropriated to ships whose forecastle was square or oblong; a circumstance common to all vessels which had two or more tiers of guns. In smaller ships the forecastle was generally shaped like a parabola, the vertex of which lay immediately above the stem. See Plate 5, Fig. 4, where *g g* represents the Beak-head.

BEAMS; were strong thick pieces of timber, stretching across the ship from side to side, to support the decks, and to retain the sides at their proper distances, with which they were firmly connected by means of strong knees, and sometimes by standards. The beams of ships of war were usually formed of three pieces scarfed together, and were sustained at each end by thick planks in the ship's side, called clamps, upon which they rested.

Beak-head beam was the broadest beam in the ship, but was generally made in two breadths dowelled together.

Midship-beam was the longest beam in the ship, being lodged in the midship-frame, or between the widest frame of timbers. At about two-thirds of the height from the keel to the lower deck, were laid a range of beams to fortify the hold and support a platform called the orlop, which contained the stores and cables of a ship. There were usually twenty-four beams on the lower deck of a ship of 74 guns, and to the other decks additional ones in proportion as the ship lengthened above.

It was necessary that the beams should have a greater height in the middle than at the two ends, to carry the water off the decks more readily, and to diminish the recoil of the guns, which would thus return more easily to their places. See Plate 4, where the beams are represented by D D.

BEDS; for cannon, were pieces of wood, having a stool at one end which rested on the hind axletrees; the other end on the bolt through the brackets, or sides of the carriage (See *e*, Plate 2, Fig. 3) for the breech of the cannon to rest on, to form a plane for the quoin to move in, in order to elevate or depress the cannon at pleasure.

BEES ; in shipbuilding, were pieces of elm plank bolted to the upper end of the bowsprit.

BELAYING-PINS ; were wooden pins, turned in a lathe, made of ash, 16 inches long, one and three-eighths inches in diameter at the upper end, which was turned as a handle for three-sevenths the length, then shouldered into one and an eighth inches in diameter. Belaying pins were later made of iron of varying sizes. They were used for the purpose of securing ropes.

BIBBS ; were brackets made of elm planks, and bolted to the hounds of the mast for the purpose of supporting the trestle-trees. (See Plate 6, Fig. 1.)

BILL ; the point or extremity of the fluke of an anchor. See this article, and Plate 1, Fig. 1.

BILL-BOARDS ; pieces of elm plank about four inches thick by two feet wide, fixed on the fore part of the fore-channels for the reception of the anchors : they had iron plates nailed to them, called bill-board plates, which enabled the anchor to move freely, when an order was given to let go.

BINDING ; the iron wrought round the dead-eyes.

BINDING-STRAKES ; were two strakes of oak in the deck, generally wrought near the hatch coamings, and worked all fore and aft : they were from one to one and a half inches thicker than the rest of the deck, and let down between the beams and ledges so that the upper side was flush with the rest of the deck.

The design of them was to strengthen and bind the rest of the deck so well together as to prevent its drawing.

BINNACLE ; a wooden case or box which contained the compass, log-glasses, watch glasses, and lights to show the compass at night. There were always two binnacles on the deck of a ship, one being designed for the man who steered, and the other for the navigating officer.

BIRTH ; or Berth, signified the room or apartment where any number of the officers or ship's company lived. In a ship of war, there was commonly one berth between every two guns.

BITS ; or Bitts, a frame composed of two strong pieces of timber, fixed perpendicularly in the fore part of a ship, on which the cables were fastened when she rode at anchor. (See Plate 4 and the article Deck). These pieces of timber being let down through square mortises, cut in the decks above and below, were bolted and forelocked to the ship's beams. There were several bitts in a ship, the principal ones being those for the cables : their upper ends commonly reached about four or five feet above the lower deck, over which the cable passed. They were supported on the fore-part by strong standards ; one arm of which was bolted to the deck, and the other to the bitts : and on the after part was fixed a strong beam of timber, parallel to the deck, and at right angles to the bitts, to which it was bolted and forelocked. The ends of this beam, which was called the cross-piece, reached about two or three feet beyond the bitts, whose upper ends were nearly two feet above the cross-piece. In ships of war, there were usually two pairs of cable-bitts. There were also the pawl-bitts, carrick-bitts, etc. These other bitts were of a smaller kind, but similar in construction, and were used to fasten the top-sail sheets, or the ropes by which the lower corners of the top-sails were extended.

BLACK-STRAKES; a range of planks immediately above the wales in a ship's side; they were always covered with a mixture of tar and lamp-black, which formed a smart contrast with the white bottom beneath, and the scraped planks of the side, covered with melted turpentine or varnish, of pine, above. All the yards were likewise daubed with this mixture, which not only preserved them, but gave them a fine gloss which contrasted well with the white varnish on the masts. (See Plate 15.)

BLOCKS; the name given to a pulley or system of pulleys, mounted in a frame or shell, but considered as detached from the ropes which ran through them. Blocks were used for various purposes in a ship, either to increase the mechanical power of the ropes employed in contracting, dilating, or traversing the sails, or to arrange the ends of them in certain places on the deck, that they might be more readily found when wanted. The blocks, which were for these purposes, disposed in various places upon the masts, yards, and sails, and amongst the rigging, were of various sizes, shapes, powers and denominations, according to the effect they were calculated to produce; and, consequently, applicable to a multitude of different purposes. Every block was composed of three, and, generally, four parts, viz.:

1. The Shell, or outside.
2. The Sheave, or wheel, on which the rope ran.

3. The Pin, or axle, on which the sheave turned.
4. The Strap, or part by which the block was made fast in its position. It was made of either rope or iron.

The single block contained only one sheave, or wheel; a double block, as may naturally be inferred, had two sheaves, one below the other; and so on. The single, double, treble, and fourfold blocks are represented in Plate 1, Figs. 10, 11, 12 and 13 respectively.

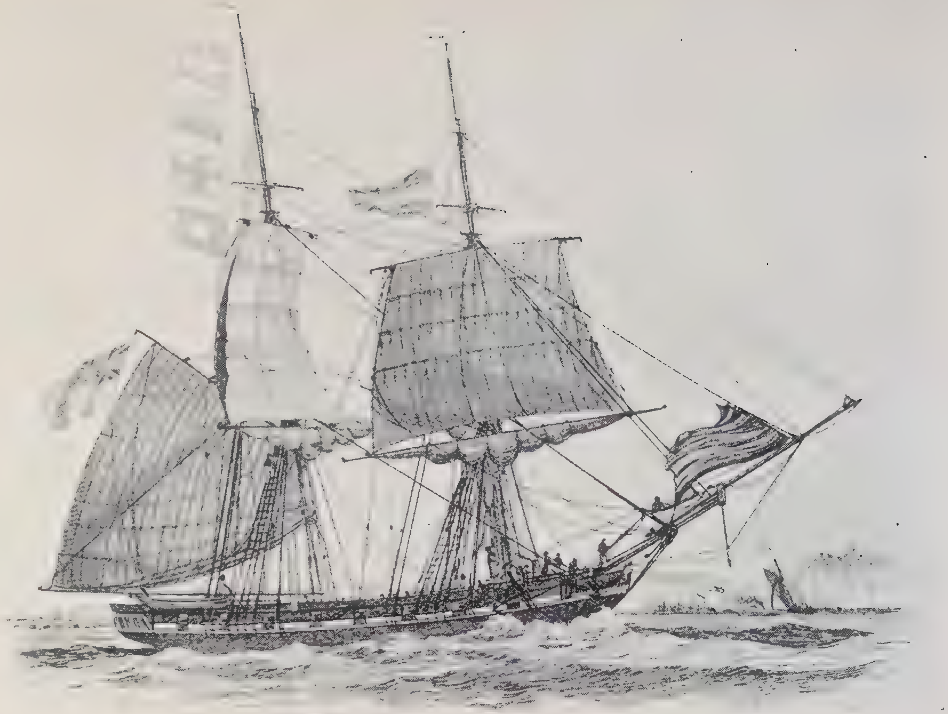
The shells of very large blocks were made of separate pieces of wood, as the cheeks of the shell, its partitions, etc. These were called made blocks. The shell was formed of several pieces of elm plank, suited to the thickness of the cheeks, sheave-holes, and partitions, and was strongly bolted together by three bolts at each end, driven through and riveted, with a washer, at the points.

Blocks were again divided into thick and thin blocks; the former being intended to receive larger ropes, and the latter small ones. The following description will serve to convey a general idea of the mode of making any of the common kinds of blocks:

The shells being sawn to their length, breadth, and thickness, the corners or angles were sawn off. The workman then gauged, or marked out, the size of the sheave-hole in the middle, one-sixteenth larger than the thickness of the sheave, and once the thickness longer than the diameter, for a single-sheaved block. In blocks of two sheaves, the partition was kept in the middle, and was one-sixth less than the sheave-hole; each sheave-hole was gauged on the two opposite sides, and in the same manner for blocks with a greater number of sheaves. The blocks were then jambed up edge-wise, with wedges, in a clave, or frame, and the sheave-holes were made in this manner; the length and breadth were first gauged out, and the holes were bored, half way through the block, along the part gauged out, with an auger the same size as the sheave-hole; then the sheave-hole was gauged, and bored on the opposite side, in the same manner, so as to meet the opposite holes. Blocks from ten inches and upwards had one hole bored at each end, and cut through with a chisel, and the wood was sawn off with a rib-saw. All blocks had the sheave-holes cleared out by chisels; and by burrs at the corners. Blocks which were to have iron straps had the straps fitted on before the wood was cut out of the middle. The hole for the pin was bored through the middle of the block, one-tenth less than the diameter of the pin. The outsides and edges of the shell were next rounded off by the stock-shave, and neatly finished by the spoke-shave. In the Royal Navy, blocks were left thick upon the edges of the cheeks, but, in merchant ships, the edges were sometimes thinned off to a small square, and somewhat rounded off.

The scores, which were the grooves to receive the strap, were gauged out along the outside of the cheeks, and tapered in depth, from nothing at the pin, to half the thickness of the strap at the ends of the block, for a single score; and the same on each side of the pin, for double scores; which were made when the block was to have double straps. The scores were gauged down across the breast of the block, to half the size of the strap, in order to allow for the serving. After the score was cut, the sheaves were fitted; they were one-tenth thicker than the diameter of the rope intended for running on them, and five times that thickness in diameter. The hole for the pin was bored through the centre of them by a bit, fixed in the mandrel of a turning lathe, or with a stock and bit opened out with an auger, one-sixteenth larger than the pin, that it might easily turn. They were then put in a lathe, and turned smooth, and the outer circumference hollowed one-third of its thickness, that the rope might embrace it closely.

The diameter of the pin was the thickness of the sheave, and was turned in a lathe, except its head, which was left octagonal, to prevent its turning in the block; and the pin was driven through the block and sheaves. After the sheaves were fitted, the inside of the sheave-hole, at one end of the block, was gauged hollow, to admit the rope, and correspond with the sheaves; and a small neat chamfer was taken off the edges. The proportions for single, double, treble, fourfold, and other blocks, were: the length was eight times the breadth of the sheave-hole, which was one-sixteenth of an inch more than the thickness of the sheave; the thickness of the sheave was one-tenth more than the diameter of the rope it was intended for; and the diameter of the sheave was five times the thickness. The breadth of the block was six times the thickness of the sheave, and the thickness was one half the length or nearly so. Flat thin blocks were three-eighths of the length thick; but all blocks, having more than one sheave, increased their thickness more, in the above proportion, by the additional number of sheave-holes, and middle parts, or partitions; the thickness of each partition was one-sixth less than the breadth of the sheave-hole. These were the general dimensions, but they sometimes varied according to the use for which they were intended.



E. W. Cooke, 1828.

THE "WOLF." BRIG OF WAR (FORMERLY OF THE ROYAL NAVY).

Making Signal and Laying To for a Pilot off Dover.

In the shell was fixed the sheave (Plate 1, Fig. 9), or sheaves, which were circular pieces of wood, usually lignum vitæ or sometimes brass, or cast metal, with a groove, turned on its edge, for the reception of the rope; and in the best blocks, the sheave had a brass bush fitted in the centre, with a round hole through it to receive the pin.

The pin, or axis, on which the sheave revolved, was made of lignum vitæ, cocus, or a West Indian wood called green-heart; but the best blocks had iron pins. The pin was supported by passing through the sides of the shell of the block, which was made of elm, ash, or tough wood, with a hole mortised through it, to receive the sheave, and confine it to revolve steadily, though freely, upon its pin, and, at the same time, keep the rope from getting off the groove in the edge of the sheave. When the block contained two or more sheaves, as many mortises were made. Sometimes the same pin served all the sheaves; and, at other times, the sheaves were placed one above the other, having, of course, separate pins.

The strap was a rope (Plate 1, Fig. 18) or, in some cases, a band of iron, encompassing the shell of the block, in a notch, or scoring, cut round the block to receive it. The strap terminated in an eye of rope, or hook of iron, by means of which one of the blocks of a tackle was attached to the object on which it was to act as a mechanical power, while the other block was suspended from some fixed support. The former was called the running block, and the latter the standing block.

The following articles will explain some of the different kinds of blocks used in shipping:

Bee blocks (Plate 1, Fig. 17) were generally made of elm ; they were seven-ninths the length of the bee, and two inches in depth, for every foot in length, and seven-eighths that depth in thickness. They were trimmed square, chamfered on the outside edges, and fitted with a sheave in one end : a hole was cut in the other end, to be fitted with a sheave, should the other fail. The sheave-hole was two-sevenths the length of the block, and one-fourth the length of the sheave hole in breadth, and half the length of the sheave-hole within the end. Bee blocks were bolted to the bowsprit, at the outer end under the bees, and the bolts served as the axis or pin for the sheave to work on : the fore-topmast-stay was reeved through the sheave-hole at the foremost end of the starboard bee block ; and the fore-topmast-preventer, or spring stay, through the after end of the port bee block.

Bull's-eye (Plate 1, Fig. 14) was a kind of wooden thimble, with a hole in the centre, and a groove in the circumference.

Cat-block (Plate 1, Fig. 20) was two or three-fold, with an iron strap and a large hook to it, and was employed to draw the anchor up to the cat-head.

Cheek-blocks, were half shells, bolted against the mast-head ; the chief bolt served for the pin of the sheave ; they received the halyards and stays of their respective masts.

Clew-garnet blocks, had single sheaves, and were suspended from the yards by a strap with two eyes ; a lashing surrounded the yard, and passed through the eyes, so as to suspend the block beneath the yard : these blocks received the clew-garnets, or ropes, which hauled up the clews of the sail ; this was applied to the main and fore-yard.

Clew-line blocks were for the same purpose as the preceding, but applied to the top-sails, top-gallant, and sprit-sails.

Dead-eye (Plate I, Fig. 15) was a large circular piece of wood having a groove in its circumference, for the shroud to lie in. The three holes, or eyes, were for a lanyard to reeve through. See the article Shroud.

Deep sea-line block was a small wooden snatch-block, from nine to eleven inches long.

An Euphroe (Plate I, Fig. 21) was a long piece of wood, having a number of holes through which the crows-foot, for the awning, etc., was reeved.

Fish block was hung in a notch at the end of the davit, and served to haul up the flukes of the anchor at the ship's bow.

A Heart (Plate I, Fig. 16) was a block of wood, with a large hole in the centre, at the bottom of which were four or five scores. Round the outside, a groove was cut, to admit of a rope, called a stay, etc.

Iron-strapped blocks frequently had the hook working in a swivel, in order to turn it, that the several parts of the rope, of which the tackle was composed, might not get twisted round each other, thus greatly diminishing the mechanical power.

Jear blocks were two-fold or treble; applied to hoist or lower the main, or fore-yards.

Jewel blocks were two small blocks, which were suspended at the extremity of the main and fore-top-sail-yards, by means of an eye-bolt, driven from without, into the middle of the yard-arm, parallel to its axis. The use of these blocks, was, to retain the upper part of the topmast studding-sail beyond the sheets of the topsails, so that each of these sails might have its full force of action, which would have been diminished by the encroachment of the other over its surface. The halyards by which the studding-sails were hoisted were passed through the jewel block, whence communicating with a block on the topmast-head, they led down to the top or deck, where they could be conveniently hoisted. See the article Sail.

Long-tackle block (Plate 1, Fig. 22) had two single sheaves placed one above the other, in the same shell. The lower sheave was only two-thirds the size of the other ; it was used in combination with a common single block to form the long-tackle, for loading or any other purchase. In the Royal Navy and East India service they were used as yard-tackles. The rope was rove through it in the same manner as if it were a common double block ; but it was preferred wherever convenient because the strap being in the centre of resistance, it hung more steadily than when the sheaves were on one pin.

Main-sheet block was used for the sheet tackle of the main-sail-booms of small vessels. The pin projected from each side of the block, being, in all, the same length as the block ; the fall or rope of the tackle was belayed or twisted round this pin, to stop it. This block was either single or double, and had a hole through the end to receive its strap.

Nine-pin block (Plate 1, Fig. 19) was shaped something like the pin from which it derived its name, though flattened on the sides, and used to lead the running ropes in an horizontal direction. Its length was generally confined to the place in which it was fixed ; and this was, for the most part, under the cross-pieces of the forecastle and quarter-deck bitts. The breadth of the block, sheave, etc., was governed by the rope, and tapered at the ends, to three-eighths of the breadth of the middle ; the pins at each end, serving as a vertical axis, were two-thirds of the size of the end, and their thickness was five-eighths of the breadth.

Shoulder Block (Plate 1, Fig. 27) was a large single block, left nearly square at the upper end, and cut sloping in the direction of the sheave. These blocks were used on the lower yard-arms, to lead in the topsail-sheets ; and, on topsail-yards, to lead in the top-gallant-sheets ; and, by means of the shoulder, were kept upright, and prevented the sheets from jambing between the block and the yard ; they were also used at the outer end of the boomkins, to lead in the fore-tackle.

Sister Blocks (Plate 1, Fig. 23) were similar to two single blocks, and formed out of a solid piece, about twenty inches long, one above the other. Between the blocks was a scoring for a middle seizing ; a round head was turned at each end, and hollowed underneath, to contain the end seizings ; along the sides, through which the pins were driven, was a groove or scoring, large enough to receive part of the topmast shrouds, in which it was seized. These blocks received the lifts and reef-tackle pendants of the topsail-yards.

Snatch Block (Plate 1, Fig. 24) had a single sheave, with a notch cut through one of its cheeks, to admit the rope, or fall, to be lifted in or out of the block, without putting its end through first. The strap did not surround the block, but was put through a hole, bored through the divided end. The figure is represented with two tails, which may be made up for a thimble, or eye, according to the situation where it was to be used, which was generally for the main, or fore-sheet, blocks of square-rigged vessels.

The snatch blocks (Plate 1, Fig. 25) were sometimes iron bound, terminating at the notched end of the block, with a swivel hook, or eye-bolt, large enough to receive several turns of lashing, which fastened the block to its fixed support. That part of the strap over the notch, in the side, lifted up with a hinge, and was confined down, when the rope was in the block, by a small pin, put across, through the end of the pin of the sheave, which projected up from the block sufficiently to pass through an eye made in the hinge part of the strap. The strap on the other part of the block was let into the block, and confined by the pin and some nails. These blocks were used for heavy purchases, where a warp or hawser was brought to the capstan.

Strap-bound Blocks were single blocks, with a shoulder left on each side, at the upper part, to admit the strap through, a little above the pin. These blocks were used at the clews of the quarter-sails, for the clew-garnets, or clew-lines ; and, under the yards, the shoulder preserved the strap from chafing.

The various blocks lashed to a ship's principal yards were as follow :

To the lower yards : The jear block, bunt-line blocks, leech-line block, lift blocks, and topsail-sheet blocks, strapped together ; quarter and slab-line blocks, strapped together ; clew-garnet blocks, tricing blocks, preventer-brace blocks ; pendant blocks, and studding-sail-halyards blocks.

To the topsail-yards : Buntline and tye blocks, strapped together ; top-gallant-sheet block, and lift block, strapped together ; jewel block, brace-pendant blocks, clew-line blocks, and a block to lead down the top-gallant sheets.

To the top-gallant-yards: Jewel, clew-line, and brace-pendant blocks.

To the mizzen-yard: Jear block, derrick block, signal-halyard block, throat-brail, middle-brail, and coak-brail blocks.

To the cross-jack-yard: Quarter blocks, jear blocks, and lift and topsail-sheet blocks, strapped together.

To the bowsprit: The bee block, bolted to the bowsprit at the outer end, under the bees; fore-bowline blocks, lashed on each side of the fore-stay collar; fore-topsail-bowline block, lashed to an eye-bolt in the bowsprit-cap.

BOAT: a small open vessel, conducted on the water by rowing or sailing. The construction, machinery, and the names of boats, were very different, according to the various purposes for which they were calculated, and the services on which they were to be employed.

The Long-boat, the largest boat that usually accompanied a ship, was generally furnished with a mast and sails, and was sometimes armed and equipped, for cruising short distances against merchant ships of the enemy, smugglers, or for impressing seamen, etc.; her principal employ, however, was to bring heavy stores or provisions on board, and also to go up small rivers to fetch wood, water, etc.

The Launch was a boat which gradually superseded the use of the long-boat; it was longer, more flat-bottomed, and by rowing a greater number of oars, was better adapted for going up narrow and shallow rivers.

The Barge, was a long, narrow, light boat, employed to carry the principal sea officers, as admirals, and captains of ships of war ashore, and was very unfit for sea.

A Pinnace resembled a barge, but was smaller, never rowing more than eight oars ; whereas, a barge never rowed less than ten. The pinnace was for the accommodation of lieutenants, etc.

Cutters of a ship were broader, deeper, and shorter than the barge or pinnace ; they were better suited for sailing, and commonly employed in carrying light stores, provisions, passengers, etc., to and from ships. In the structure of this sort of boat, the lower edge of every plank in the side overlay the upper edge of the plank below it, which was called clinch-work. They were generally rowed with six oars, sometimes only with four ; in which case they were termed jolly-boats.

Yawls were something less than cutters, nearly of the same form, and used for similar services.

A Gig was a long narrow boat, used for expedition, generally rowed with six or eight oars, and was mostly the private property of the captain or commander.

Jolly-boat, a smaller boat than the yawl, kept aboard ships, for going on shore and other light work.

Fig. 1, Plate 12, represents the sheer-draught or elevation of a 14-oared double-banked pinnace ; Fig. 2, the half-breadth, and Fig. 3, the body plan thereof.

Fig. 4 shews the sheer-draught of a 12-oared double-banked launch ; Fig. 5, the half-breadth, and Fig. 6, the body plan of same.

Fig. 7, the sheer-draught of a 6-oared gig ; Fig 8, the half-breadth, and Fig. 9, the body plan.

These boats are respectively drawn to the scale of one-sixth of an inch to a foot.

The above boats more particularly belonged to ships of war, as merchant ships seldom had more than two—viz. a long-boat and a yawl—when they had a third, it was generally calculated for the countries to which they traded, and varied in its construction accordingly.

BOATSKIDS; were long square pieces of fir, extending across the ship from the gang-boards, and on which the boats, spare masts, etc., were stowed.

BOB-STAY; a rope used to confine the bowsprit downwards to the stem or cut-water. (See Plate 15, No. 5). It was fixed by thrusting one if its ends through a hole bored in the fore part of the cut-water for this purpose, then splicing both ends together so as to make it twofold, or like the link of a chain: a dead-eye was then seized into it, and a lanyard passing through this, communicated with another dead-eye on the bowsprit, and was drawn tight with the aid of mechanical powers. See the article Bowsprit.

The use of the bob-stay was to draw down the bowsprit, and keep it steady; and to counteract the stays of the foremast, which drew it upwards. The bowsprit was also fortified by shrouds from the bows on each side, which were all essential, as the foremast and the upper part of the mainmast were stayed and greatly supported by the bowsprit. For this reason, the bob-stay was the first part of a ship's rigging to be set up.

Bob-stay holes were those in the fore part of the knee of the head, for the security of the bob-stay.

BOLLARD-TIMBERS, or Knight-heads; were two pieces of timber rising just within the stem, one to each side of the bowsprit to secure its inner end. They are represented by *c c* in Plate 5, Fig. 4.

BOLSTER ; a piece of timber placed upon the upper or lower cheek, worked up about half the depth of the hawse-holes, and cut away for the easement of the cable, and to prevent its rubbing the cheek : likewise the solid piece of timber that was bolted to the ship's side, on which the stanchions for the lining of the anchors were placed.

BOLSTERS ; small cushions or bags, filled with tarred canvas, laid between the collars of the stays, and the edge of some piece of wood on which they lay : they were used to preserve the stays from being chafed by the motion of the masts, as the ship laboured at sea. They were also pieces of wood, rounded on the upper part, and covered with several layers of tarred canvas, to prevent the rigging being chafed by the motion of the ship or masts.

BOLT ; a cylindrical pin of iron, of which there were various sorts, used for sundry occasions in shipbuilding.

The bolts were principally employed either to unite several members of a ship's frame into one solid piece, or to fasten any moveable body on a particular occasion. Those which were calculated for the former purpose had commonly small round heads, somewhat flattened, called saucer heads, with a mortise on the opposite end or point, which were used to fasten moveable pieces to those that were fixed : the bolts which were intended for the latter use, on the contrary, had either a large round head, as those of the chains, or an eye, with or without a ring in the same place, as those which were designed to secure the guns, the jears of the main and fore-sail, the stoppers of the cable, etc. They were also used for lashing or hooking blocks, etc., and were driven into mast-heads, yards, caps, etc.

Bolts were short or long according to the thickness of the timber in which they were to be lodged: they penetrated either right through the pieces into which they were driven, or to a certain determinate depth. The last of these, called a rag-bolt, was retained in its position by means of several barbs, which, fastening into the timbers, prevented the bolt from loosening by the working of the ship. The first, after being driven through the pieces to be joined, was confined by a flat iron wedge, called the forelock, which was thrust through a small hole in the narrow end of the bolt, where it was hardened home by a hammer; and to prevent the forelock from cutting the wood-work in this position, a little iron ring was fixed over the end of the bolt, between the forelock and the timber.

Those bolts which had the largest of the round heads were called fender-bolts, being driven into the wales, stem, or sides of some small vessels of burden, as lighters, beancods, prames, etc., to defend their timber-work from the shock of any other vessel which might collide with them.

Some bolts had a square part left at the back of the eye, that they might not be driven on the eye, and consequently be in danger of splitting.

BOLT-ROPE; a rope to which the edges or skirts of the sails were sewn, to strengthen and prevent them from rending. That part of the bolt-rope which was on the perpendicular parts of a sail, was called the leech-rope; that at the bottom, the foot-rope; and that on the top, the head-rope. Stay-sails, whose heads were formed like an acute angle, had no head-rope. To different parts of the bolt-rope were fastened all the ropes employed to contract or dilate the sails. See Plate 3, Fig. 20, where *a b* represents part of the bolt-rope of a sail.

BONNET; an additional part made to fasten with latchings to the foot of the sail of small vessels with one mast, in moderate winds. It was exactly similar to the foot of the sail for which it was intended. They were commonly one-third of the depth of the sails to which they were fitted.

BOOM-IRON; was composed of two iron rings, formed into one piece, so as to nearly resemble the figure 8. It was employed to connect two cylindrical pieces of wood together, when one was used as a continuation of the other; such was the jib-boom to the bowsprit; and such were the studding-sail-booms to the respective yards from whose extremities they were prolonged. The rims or circles of the boom-irons were broad and flat; and one of them which was firmly driven upon the main, or fore yard-arm, was somewhat larger than the other, as shown in Plate 1, Fig. 26. The studding-sail-boom usually rested in the small ring, through which it could be thrust outwards from the yard-arm when the studding-sail was to be set. Every boom of this kind had usually two boom-irons, one of which was fixed on the extremity of the yard, and the other further inwards. The former of these was frequently framed of one ring only, which projected from the end of the yard, where it was fastened by a strong iron bar, opening into a sort of fork or crotch that slid upon the yard lengthways, where it was fastened by nails driven from above and below.

BOOMS ; were long poles run out from different places in a ship, to extend the bottoms of particular sails. Of these there were several sorts ; as the jib-boom, flying-jib-boom, studding-sail-boom, ring-tail boom, driver or spanker-boom, main-boom, and square-sail-boom ; the two last, however, were only appropriated to small ships of one or two masts. Booms somewhat differed in their shapes from each other, some tapered regularly from the middle to the end like the yards ; others from one-third the length to the extremity. See the article Jib, etc.

The proportions for the lengths and diameters of booms were :

Length of Booms.—Lower Studding-sail-booms, five-ninths the main-yard.

Top Studding-sail-booms, one half the length of the yards they went on.

Flying Jib-boom, five-sevenths of the bowsprit.

Driver-boom, the same length as the main-topsail-yard.

Diameters of Booms.—Studding-sail-booms, one inch to every five feet in the length.

Flying Jib-booms, seven-eights of an inch to every yard in the length.

Driver-Boom, the same as the fore-topsail-yard.

The following Tables contain the lengths and diameters of all the booms now (1815) used in the different classes of ships and vessels in the Royal Navy :

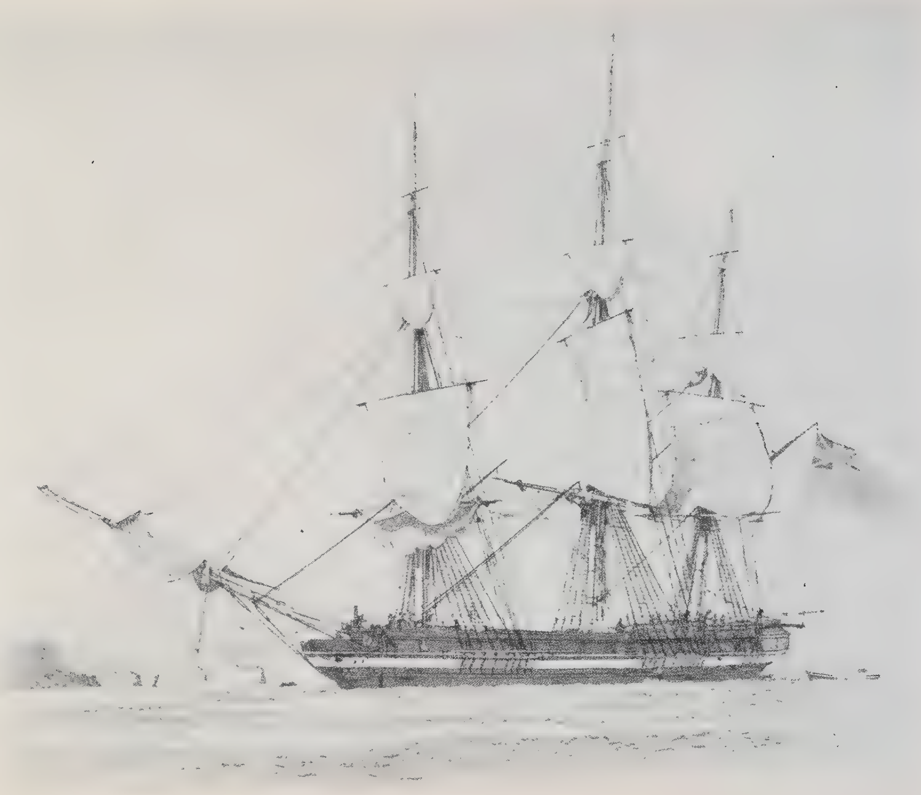
	110 Guns.			90 Guns.			80 Guns.		
	2,164 Tons.			1,870 Tons.			1,620 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Jib-Boom	53	0	15¼	50	9	14½	48	0	14
Driver-Boom	—	—	—	—	—	—	—	—	—
Lower-Studding-Sail-Boom	56	9	11¼	54	6	11	51	6	10¼
Main-Topmast ditto	51	2	10⅛	49	0	10	46	6	9¼
Main-Topgallant ditto	36	6	7¼	35	0	7	33	3	6¾
Fore-Topmast ditto	44	6	9	42	10	8½	40	8	8⅛
Fore-Topgallant ditto	32	3	6½	30	6	6⅛	29	0	5⅞
Fire-Boom	38	0	11¼	36	0	11	34	0	10¼

	74 Guns.			64 Guns.			50 Guns.		
	1,800 Tons.			1,369 Tons.			1,044 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Jib-Boom	50	4	14½	43	9	13	39	8	11¾
Driver-Boom	—	—	—	—	—	—	60	9	11½
Lower-Studding-Sail-Boom	53	9	10¾	50	0	10	45	6	9⅛
Main-Topmast ditto	48	6	9¾	45	0	9	41	0	8⅛
Main-Topgallant ditto	35	0	7	32	8	6½	30	5	6
Fore-Topmast ditto	42	6	8½	39	9	8	36	0	7¼
Fore Topgallant ditto	31	0	6¼	28	9	5¼	26	3	5¼
Fire-Boom	35	6	10¾	33	3	10	30	0	9⅛

	44 Guns.			38 Guns.		
	879 Tons.			951 Tons.		
	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	Ins.	Ins.
Jib-Boom	39	0	11½	38	7	11½
Driver-Boom	57	6	10¾	59	0	11½
Lower-Studding-Sail-Boom	44	6	9	45	0	9
Main-Topmast ditto	40	0	8	41	0	8⅛
Main-Topgallant-ditto	28	9	5¾	29	6	6
Fore-Topmast ditto	35	0	7	35	9	7⅛
Fore-Topgallant ditto	26	0	5¼	26	6	5¼
Fire-Boom	29	6	9	30	0	9

	36 Guns.			32 Guns.			28 Guns.		
	871 Tons.			677 Tons.			594 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Jib-Boom	38	0	11¼	36	10	10¾	35	0	10¼
Driver-Boom	57	0	11	55	0	10	52	0	9¾
Lower-Studding-Sail-Boom	44	0	9	41	0	8¾	40	0	8
Main-Topmast ditto	39	6	8	37	2	7½	36	0	7⅛
Main-Topgallant ditto	28	6	5¾	27	6	5½	26	0	5¼
Fore-Topmast ditto	34	8	7	32	6	6½	31	1	6⅛
Fore-Topgallant ditto	25	10	5⅛	24	0	4⅞	23	0	4⅝
Fire-Boom	29	3	9	27	3	8¾	26	6	8

	24 Guns.			20 Guns.			Sloops of		
	513 Tons.			429 Tons.			300 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Jib-Boom	32	6	9⅜	31	0	9	27	0	8
Driver-Boom	47	0	8⅝	45	6	8½	39	6	7⅞
Lower-Studding-Sail-Boom	36	9	7¼	35	0	7	30	6	6
Main-Topmast ditto	33	0	6½	32	0	6⅜	27	0	5⅜
Main-Topgallant ditto	23	6	4¾	22	6	4½	19	9	4
Fore-Topmast ditto	28	10	5¾	27	6	5½	24	2	5
Fore-Topgallant ditto	20	6	4⅛	20	0	4	17	6	3½
Fire-Boom	24	0	7¼	23	6	7	20	6	6



E. W. Cooke, 1828.

FIRST CLASS WEST INDIAMAN ("THETIS," CAPT. BURTON).

Getting under weigh off the Needles, I.W.

BORE, of a cannon; among engineers, denoted the diameter of the barrel of a gun or cannon, or rather its whole cavity.

BOTTOM, of a ship; comprehended all that part which was under water when the ship was laden; the figure of it was therefore determined by the qualities required in the ship, and the purposes for which she was designed.

A ship of war had to carry her lowest tier of cannon sufficiently above the surface of the water to be used when necessary. Had this quality been neglected, a small ship would have had the advantage of a large one, inasmuch as the latter could not have opened her lower battery in a fresh side-wind, without being exposed to extreme danger, by receiving a great quantity of water in at her ports between decks.

Many shipwrights considered it extremely difficult, if not impracticable, to build a ship that would carry her cannon well, bear a competent sail, and advance swiftly through the water; because a very full bottom was necessary to acquire the two first qualities, whereas a sharp floor was better fitted to procure the latter. But when it is remembered that a full ship would carry a much greater force of sail than a sharp one, a good artist might form the body so as to unite all these three qualities with the additional one of steering easily, by paying attention to the following general rules:

"To make a ship carry a good sail. A flat floor-timber somewhat long, or the lower-futtocks pretty round, a straight upper-futtock, the top-timber to throw out the breadth aloft; at any rate to carry the main-breadth as high as the lower-deck. Now if the rigging be well adapted to such a body, and the upper works lightened as much as possible, so that the whole contributes to lower the centre of gravity, there will be no reason to doubt of the ship's carrying a good sail.

" To make a ship steer well, and answer the helm readily. If the fashion-pieces be well formed, the tuck, or spreading parts under the stern, carried pretty high ; the midship-frame well forward ; a considerable additional depth in the draught of water aft more than forward ; a great wake forward and none aft ; a snug quarter-deck and forecastle : all these will greatly facilitate the steerage ; and a ship that sails well will always steer easily.

" To make a ship carry her guns well out of the water. A long floor-timber, and not of great rising ; a very full midship-frame, and low tuck, with light upper works.

" To make a ship go smoothly through the water, and prevent her from pitching heavily. A long keel ; a long floor ; not to rise too high fore and aft ; but the area or space contained in the fore-body, according to the respective weight it is destined to carry : all these are necessary to make a ship pass easily through the sea.

" To make a ship keep a good wind, and drive little to leeward. A good length by the keel ; not too broad, but pretty deep in the hold, which will occasion her to have a short floor-timber, and a very great rising. As such a ship will meet with great resistance in driving sideways, and feel very little in advancing or going ahead, so she will fall very little to leeward.

" Being thus furnished with the methods to qualify a ship for the different purposes of navigation, the only difficulty remains to apply them properly in the construction, which must, in a great measure be left to the judgement of the artist. The whole art then is evidently to form the body in such a manner that none of these qualities shall be entirely destroyed; and in giving preference to that which is principally required in the service for which the ship is destined.

"All ships, whether full for burden, or sharp for sailing, should be built with the full parts of their bottoms to form an arch downwards, instead of having long straight floors, as it is well known when a round cannon ball is shot slanting into the water, the reaction makes it rise into the air several times, before it immerses and sinks, though it is about eight times heavier than its bulk in water, which will naturally act with the same principles upon ships which have their bottoms somewhat circular all the way, as they are forced through the water, the entrance and fore body of the ship in the water, have the passage to open by dividing and sinking the particles of water, till they have passed the main-frame or lowest flooring; the reaction of the water upwards against this shaped bottom will naturally tend to lighten and lift the ship from plunging into the sea, all the way that there is any resistance, which is reckoned to cease at the lowest main-frame, for there the water begins to rise and close again to its own level, which acts upon the tapered after body, and runs, if well formed, so as to help the ship forward in her progressive motion. And she will naturally act and turn upon this lowest part of the bottom, because within this main or midship-frame must be the centre of the greatest cavity or hollow part of the ship's hold; and thereabouts will be the centre of gravity of the ship and all that she contains, and will thereby become the centre of motion: the water's pressure upwards being greatest against this lowest part of the bottom, all will contribute naturally to make this the proper centre for the ship to turn upon, to make her more manageable in steering, staying, or wearing: and this last was a very valuable property, for it is most commonly wanted when the ship is in the greatest danger, and, expeditiously performed, may be the saving of the whole. This seems to be pointed out by natural judgement, and what may be seen in the mechanism of nature; and the curve of a ship's bends and upper works do not offend, but please the eye, and all straight flat parts about a ship disgust. The swiftest fish seen in motion at sea, as well as those fowl which swim and dive in water, are all formed with their bodies rounding, as is above recommended. This form of rounding ship's bottoms, will also recommend itself to take the ground with the least damage."

BOW; was the rounding part of a ship's side forward, beginning where the planks arch inwards, and terminating where they close, at the stem or prow. See the article Head, and Plate 5, Fig. 4, where the bow of a ship is represented at large. It has been proved by a variety of experiments that a ship with a narrow bow is much better calculated for sailing swiftly, than one with a broad bow; but is not so well fitted for a high sea, into which she always pitches or plunges her fore part very deeply, for want of sufficient breadth to repel the volume of water, which so easily divides in her fall. The former of these was called by seamen a lean, and the latter a bluff bow.

Doubling of the Bow, was the vertical thick stuff placed there to prevent the anchor bill from tearing it in passing up and down. See the article Bill-board.

BOWLINE ; a rope fastened near the middle of the leech, or perpendicular edge of the square sails, by three or four subordinate parts called bridles. It was only used when the wind was so unfavourable that the sails were all braced sideways, or close-hauled to the wind. In this situation the bowlines were employed to keep the weather or windward edges of the principal sails tight forward and steady, without which they would have been continually shivering, and rendered incapable of service. See the article Sail.

BOWLINE-BRIDLES ; the rope by which the bowline was fastened to the leech of the sail.

BOWSPRIT ; (Plate 15, No. 1) a large boom or mast, which projected over the stem, to carry sail forward, in order to govern the fore part of a ship, and counteract the force of the after-sails, or those extended behind. It was otherwise of great use, being the principal support of the foremast, by confining the stays whereby it was secured and enabled to carry sail. These were great ropes stretching from the mast-head to the middle of the bowsprit, where they were drawn tight. See the articles Stay and Dead-eye.

The bowsprit was, like the masts, rounded, except at the outer end, which was square. The rule for its rise was an angle of about thirty-six degrees with the horizon. It was two-thirds the length of the main-mast, and its thickness equal to the mizzen-mast: when it was twelve fathoms five feet long, its yards were eight fathoms two feet long, and the topmast of the bowsprit three fathoms and one foot.

BRACE; a rope employed to wheel or traverse the sails upon the mast, in a direction with the horizon, when it was necessary to shift the sails, that they might correspond with the direction of the wind and course of the ship. Braces were, for this purpose, fastened to the extremities of the yards, which were called yard-arms. (See Plate 15, No. 16).

All the braces of the yards were double, except those of the top-gallant, and sprit-sail-top-sail-yards. The mizzen-yard was furnished with fangs, or vangs, in place of braces. See the article Mizzen.

Brace was also another name for Goodgeon, which article see.

BRACKET; short crooked timbers resembling knees, fixed in the frame of a ship's head, to support the gratings: they also served to support the gallery.

Brackets, ornaments; the hair bracket was the boundary of the after part of the figure of the head, the lower part of which finished with the fore part of the upper cheek. The console-bracket was a light piece of ornament at the fore part of the quarter-gallery, sometimes called a canting livre.

BRAILS; ropes passing through pulleys on the mizzen-mast and yard, and fastened, in different places, to the aftmost leech of the sail, to truss it close up, as occasion required. See the article Mizzen.

Brails were also used to the mizzen-stay-sail and main-top-sail, either for the purpose of furling them, or preventing them from being chafed by flapping about from side to side, when going before the wind.

BREADTH ; the measure of a ship from side to side in any particular place : it was usually distinguished into extreme breadth, main-breadth, and top-timber-breadth.

As the sides of the ship were formed by a variety of ribs, called timbers, and the area of those timbers being of different breadth above and below, it was necessary to distinguish them in the construction, in order to form their several curves, and fix the corresponding pieces with accuracy and precision. The part of every timber which enclosed the greatest space from the middle-line of the ship's length, was therefore called the main-breadth ; and the distance between the upper part of the same timber and the middle-line of the ship's length was called the top-timber-breadth.

As the ship was also broader at the midship-frame than in any other point of her length, the distance between her sides in the main-breadth of that timber, was called the extreme breadth of the ship.

BREASTHOOKS ; thick pieces of timber, incurvated into the form of knees, and used to strengthen the fore part of the ship, where they were placed at different heights, directly across the stem, so as to unite it with the bows on each side.

The breast-hooks were strongly connected to the stem and hawse-pieces by tree-nails, and by bolts driven from without, through the planks and hawse-pieces, and the whole thickness of the breast-hooks, upon whose sides those bolts were forelocked, or clinched upon rings. They were usually about one-third thicker, and twice longer than the knees of the decks which they supported.

There were usually four or five of these pieces in the hold, between the kelson and the lower-deck, upon the upper part of which the planks of that deck were rabbetted. There were two placed between the lower and second decks, one of which was immediately beneath the hawse-holes, and the other under the second deck, whose planks were laid thereon, and upon which the inner end of the bowsprit frequently rested.

The fore side of the breast-hooks which was convex, was formed so as to correspond with the place in which it was stationed, that is to say, it conformed exactly to the interior figure of that part of the bow where it was fayed: accordingly, the branches, or arms, of the breast-hooks, made a greater angle as they were more elevated above the keel, whilst the lower ones were more incurvated, and were almost figured like the crotches.

It not being necessary that the inner or concave side of these pieces should retain a regular form, the artificers frequently let them remain as thick as possible, to give additional support to the ship's fore part, where she sustained the whole shock of resistance in dividing the water, or in plunging into it.

BREAST-RAIL; the upper part of the balcony, or the breast-work, on the quarter-deck.

BREECH of a gun; the distance from the hind part of the base-ring to the beginning of the bore. It was always equal to the thickness of the metal at the vent.

BREECHING; a strong rope used to secure the cannon, and prevent them from recoiling too much in time of battle. The breeching is represented by *e* in Plate 4.

It was fixed by reeving it through a thimble, strapped upon the cascabel or pumelion of the gun, and the two ends of it were then clinched on each side of the port, to ringbolts in the ship's sides.

The breeching was of sufficient length to permit the muzzle of the cannon to come within the ship's side, to be charged, or to lie housed.

BRIG, or Brigantine; a small merchant ship, with two masts. Amongst English seamen this vessel was distinguished by having her main-sail set nearly in the plane of her keel, whereas the main-sails of larger ships were hung athwart, or at right angles to the ship's length, and fastened to a yard which hung parallel to the deck, but, in a Brig, the foremost edge of the main-sail was fastened, in different places, to hoops which encircled the main-mast, and slid up and down it, as the sail was hoisted or lowered; it was extended by a gaff above, and by a boom below. See Plate 16, Fig. 5.

This term was not universally confined to vessels of a particular construction, or which were masted and rigged in a method different from all others. It was variously applied, by the mariners of different European nations, to a particular sort of vessel of their own marine.

BROADSIDE; all that part of a ship above the water which was situated between the bow and the quarter, and in a position nearly perpendicular to the horizon.

BUCKLERS ; two pieces of wood fitted together, to stop the hawse-holes, leaving only sufficient space between them for the cable to pass, and thereby preventing the ship from taking in much water in a heavy sea.

BULGE (originally written Bilge) ; the part of a ship which bulged out at the floor-heads, to assist the ship when taking the ground.

BULK-HEADS ; partitions built in several parts of a ship between two decks, either fore and aft or athwartships, to form and separate the various compartments. Those which enclosed the magazine were oak-plank and rabbetted, as were those of the spirituous liquor room ; others in the hold were generally oak-plank, and the edges were cyphered, to keep the gravel or dirt of the ballast in the hold from getting into the store-rooms, or into the wells to damage the pumps.

The bulk-head afore was the partition between the forecastle and gratings in the heads, and in which were the chase ports.

BUMKIN, or Boomkin (Plate 15, No. 3) ; a short boom or beam of timber, projecting from each bow of a ship, to extend the clew, or lower edge, of the fore-sail to windward ; for which purpose there was a large block fixed on its outer end, through which the tack was passed, which being drawn tight down, brought the corner of the sail close to the block, and then the tack was said to be aboard.

The boomkin was fitted above the main-rail in the head, and secured by a strong rope, or iron-brace, which confined it downwards to the ship's bow, to counteract the strain it bore from the fore-sail above, dragging it upwards.

BUNT ; the middle part, or cavity of the square sails, as the fore-sail, main-sail, top-sails, and top-gallant-sails. If we suppose one of these sails to be divided into four equal parts, from one side to the other, then the two middle divisions, which comprehend half of the sail, may be called the limits of the bunt.

BUNTLINE-CLOTH ; the lining sewn up the centre of the sail in the direction of the bunt-line, to prevent the sail from being chafed.

BUNTLINES (Plate 8, Fig. 6) ; ropes fastened to cringles on the bottoms of the square sails, to draw them up to their yards ; they were rove through certain blocks above, or passed over the upper part of the yard, whence passing downwards on the fore part of the sail, they were fastened below to the lower edge, in several places of the bolt-rope. See the article Sail.

BURDEN, of a ship, was commonly determined thus by builders : multiply the length of the keel, taken within board, by the breadth of the ship within board, taken from the midship-beam from plank to plank, and multiply the product by the depth of the hold, taken from the plank below the kelson, to the under part of the upper deck plank, and divide the last product by 94, then the quotient was the content of the tonnage required.

BUTT ; the end of a plank in a ship's side or bottom, uniting with the end of another. Butt also signified the lower end of made masts, and the end of haunches, cokes, etc. Butt and butt, was a term denoting that the ends of two planks came together, but did not overlap.

BUTTOCK ; the convexity of a ship aft, under the stern ; it was terminated by the counter above, by the after part of the bilge below, by the rudder in the middle, and by the quarter on the side.

C

CABLE ; a thick, large, strong rope, of considerable length, to which the anchor was fastened, and used to retain a ship at anchor. Cables were of various sorts and sizes. In Europe they were usually manufactured of hemp ; in Africa they were more frequently composed of bass, which was a sort of long straw or rushes ; and in Asia of a peculiar sort of Indian grass. Every cable, of whatever thickness, was generally formed of three ropes twisted together, which were then called strands ; each of these was composed of three smaller strands ; and these last of a certain number of rope-yarns. This number was therefore greater or smaller in proportion to the size of the cable required.

Every ship was supposed to be furnished with at least three good cables—viz., the chief cable, or cable of the sheet-anchor, and the two bowers, being a common cable and a smaller one.

All cables were made 120 fathoms in length ; for which purpose the threads or yarns were 180 fathoms, as they were diminished one-third in length by twisting.

The following Table gives the number and size, of cables for a ship of each class :

Rate of Ship.	No of Guns.	No of Cables.	Size in Inches.
1st.	100	9	23½
		1	14
2nd.	90	9	22½
		1	13½
3rd.	80	8	21½
		1	13
	70	7	20½
		1	12½
4th.	60	7	19½
		1	11½
	50	7	18½
		1	11
5th.	40	7	17
		1	10
6th.	24	6	15
		1	8½
Sloops		5	13
		1	8

CABLE-TIER ; that place on the orlop-deck, where the cables were coiled up and stowed away.

CANNON ; a piece of artillery, mounted in battery on the decks of a ship, and used in all naval engagements. It may be defined as a long round hollow engine, made of iron or brass, etc., for throwing balls, etc., by means of gunpowder.

The principal parts of a sea-cannon, as represented in Plate 2, Fig. 1, were :

First.—The breech, A C, and its button, or cascabel, A *h*, called by seamen the pomelion. The breech was generally understood to be the solid metal from the bottom of the concave cylinder to the cascabel, which was the extremity of the cannon opposite to its muzzle.

Second.—The trunnions, T, which projected on each side like arms, and served to support the cannon near the middle of its length : on these it could be poised, and held almost in equilibrio. As the metal was thicker at the breech than towards the mouth, the trunnions were placed nearer that end than the other.

Third.—The bore or calibre, is comprehended between the dotted lines, and particularly expressed in the longitudinal section of a 32-pounder, Fig. 2. This represents the interior or concave cylinder, wherein the powder and shot were lodged with which the cannon was charged: the entrance of the bore was called the mouth.

The names of the other parts included in Plate 2, Fig. 1, were:

A B, the length of the cannon.
A E, the first reinforce.
E F, the second reinforce.
F B, the chace.
H B, the muzzle.
A o, the cascabel, or pomelion.
A C, the breech.
C D, the vent-field.
F I, the chace-girdle.
r s, the base-ring and ogee.
t, the vent-astragal and fillets.
p q, the first reinforce-ring and ogee.
v w, the second reinforce-ring and ogee.
x, the chace-astragal and fillets.
z, the muzzle-astragal and fillets.
n, the muzzle-mouldings.
m, the swelling of the muzzle.
A *i*, the breech-mouldings.

The diameter of the ball was always somewhat less than the bore of the piece, that it might be discharged with greater ease, and not damage the piece by rubbing it too forcibly in its passage; and the difference between these diameters was called the windage of the cannon.

The length of any cannon was always reckoned from the hind part of the base-ring, or beginning of the cascabel, to the extremity of the muzzle. The second reinforce began at the same circle where the first terminated; and the chace at the same circle where the second reinforce ended.

The first reinforce, therefore, included the base-ring; the ogee nearest to it; the vent-field; the vent-astragal; and first reinforce-ring. The second reinforce contained the ogee next to the first reinforce-ring and the second reinforce-ring. The chace comprehended the ogee nearest to the second reinforce-ring; the chace-girdle and astragal; and the muzzle and astragal. The trunnions were always placed on the second reinforce so that the breech-part of the cannon might weigh something more than the muzzle-part, to prevent the piece from starting up behind when it was fired.

The metal of cannon was not equally thick in all parts; but was, in some measure, proportioned to the force of the powder which it was to resist. At the breech, where the effort was strongest, the thickness of the metal was equal to the diameters of the corresponding shot. At the first reinforce, where this began to slacken, the thickness was somewhat less than at the breech: at the second, where the force was still further diminished, the thickness was more reduced than at the first: and, by the same rule, the chace had less thickness than the second reinforce. The thickness of the chace gradually diminished from the trunnions to the mouth of the piece: so that if a cannon were without cascabel, trunnion, and mouldings, it would exactly resemble the frustrum of a cone, or a cone deprived of the small end.

In a vessel of war, cannon were placed on a sort of wheeled sledge, called the carriage, of which Fig. 3, Plate 2, is the plan, and Fig. 2, Plate 3, the elevation. This carriage was composed of two large pieces of plank, called sides or cheeks, connected together by means of cross-pieces, which were either bolts, axle-trees, or transoms. The two axle-trees were fixed across under the fore and hinder parts of the carriage, being supported at their extremities by solid wooden wheels, called trucks. The transom was placed directly over the fore axle-tree, and exactly in the middle of the height of the cheeks or side-pieces. The height of the transom was equal to two diameters of the shot, and the breadth to one diameter.

The following reference will explain the iron-work and different parts of a sea-carriage, as exhibited in the plan and elevation of a 32-pounder in Plate 2, Fig. 3, and Plate 3, Fig. 2.

a. The cap-squares, commonly called clamps in the sea-service.

b. Eye-bolts, by which one end of the clamp was fixed to the carriage.

c. Joint-bolts, upon which the other end of the clamp was fixed over the trunnions; after which it was forelocked, to prevent the cannon from starting out of its carriage when fired.

b g. The cheeks, or sides, of the carriage.

d. The transom-bolt.

e. The bed-bolt, upon which the bed rested, to support the breech of the cannon.

f. Hind axle-tree bolts.

g. Breeching-bolts, with rings, through which the breechings passed.

h. Loops, or eye-bolts, to which the gun-tackles were hooked.

i. The fore axle-tree, with its trucks, *k*.

l. The hind axle-tree, with its trucks, *k*.

The wheels were firmly retained upon their axle-trees, by means of iron bolts passing through the latter without the wheels: these bolts were called linch-pins.

The breadth of the wheels was always equal to that of the cheeks; but the height of the cheeks and diameter of the trucks had to conform to the height of the gun-ports above the deck. The carriages of the lower-tiers were therefore so formed, that when the breech of the cannon lay upon the hind axle-trees, the muzzle of the piece touched above the port, as expressed in Plate 3, Fig. 4, which represents a cannon secured by its tackles and breechings, to prevent it from straining the ship when she rolled in a heavy sea.

The fluctuating motion of the sea rendered it necessary to secure and confine the artillery in vessels of war, by several ropes and pulleys, which were called the gun-tackles and breechings, without which they could never have been managed in a naval engagement. The breeching has been already explained as employed to restrain the recoil. The tackles (See Plate 3, Fig. 3, and Plate 4) were hooked to ring-bolts in the sides of the carriage, and to other ring-bolts in the side of the ship, near the edges of the gun-ports, and were used to draw the piece out into its place after it was loaded. Besides these there was another tackle, hooked to the rear or train of the carriage, to prevent the cannon from rolling into its place before it was charged: this was called the train-tackle, and is exhibited in Plate 3, Fig. 2.

In ships of war, the cannon of the lower decks were usually drawn into the ship while at sea, except during an engagement. They were secured by lowering the breech, so that the muzzle bore against the upper edge of the port, after which the two parts of the breeching were firmly braced together by a rope which crossed them between the front of the carriage and the port; which operation was called frapping the breeching. The tackles were then securely fastened about it, with several turns of the rope extended from the tackle and breeching, over the chace of the cannon, as shown in Plate 3, Fig. 4.

The following table contains the length, weight, and diameter of cannon, as used for service in the Royal Navy in 1815.

Pounders.	Length. Ft.	Length. Ins.	Weight. Cwt.	Weight. qrs.	Diameter in inches.
32	9	6	55	2	6.4
24	9	6	50	2	6.8
	9	0	47	3	
18	9	0	42	2	5.3
	8	0	37	3	
12	9	0	34	3	4.7
	8	6	33	1	
	7	6	29	1	
	7	0	21	0	
9	9	0	31	0	4.2
	8	6	29	2	
	7	6	26	2	
	7	0	25	1	
6	8	6	22	1	3.7
	8	0	21	2	
	7	6	20	1	
	7	0	19	1	
	6	6	18	2	
	6	0	17	2	
4	5	6	11	3	3.2
3	4	6	7	1	2.9

Swivel-CANNON; a small piece of artillery carrying a shot of a pound or half a pound, and fixed in a socket in different parts of a ship. The trunnions of this piece were contained in a sort of iron crotch, whose lower end terminated in a cylindrical pivot resting in the socket, so as to support the weight of the cannon. The socket was bored in a strong piece of oak, reinforced with iron hoops, to enable it to sustain the recoil. By means of this frame, which was called the swivel, and an iron handle on its cascabel, the gun could be directed by hand to any object. It was generally used in the tops of ships of war, and frequently loaded with musket balls, to fire down on the upper decks of an adversary.

CAP; a strong, thick block of wood, used to confine two masts together, when the one was erected at the head of the other in order to lengthen it. It was for this purpose furnished with two holes perpendicular to its length and breadth, and parallel to its thickness; one of these was square, and the other round; the former being solidly fixed upon the upper end of the lower-mast, whilst the latter received the mast employed to lengthen it, and secured it in position.

The principal caps of a ship were those of the lower masts, which were fitted with a strong eye-bolt on each side, in which to hook the blocks by which the topmast was drawn up through the cap.

The breadth of all caps was equal to twice the diameter of the topmast, and the length to twice the breadth. The thickness of the main and fore-caps was half the diameter of their breadths; the mizzen-cap three-sevenths, and the topmast caps two-fifths of their respective breadths.

In the same manner as the topmast passed up through the cap of the lower-mast, the top-gallant-mast passed up through the cap of the topmast. The cap is represented by Plate 3, Fig. 10.

CAPSTAN ; a strong massive column of timber, formed like a truncated cone, and having its upper extremity formed into several squares with holes in them, to receive the bars or levers. It was let down perpendicularly through the decks of the ship, and placed in such a manner, that the men, by turning it horizontally with their bars, might perform any work which required an extraordinary effort, as heaving in the cable, and thereby bringing the ship's head nearly perpendicular to the anchor, in order to dislodge it from its bed in the ground : it was also used to wind up any weighty body, as the masts, artillery, etc. In Plate 4 the position of the main capstan is represented by P *p* and that of the jear capstan by P.

There were two capstans in a ship of the line—namely, the fore and the main—the former was placed in the fore part of the ship abaft the foremast, and the latter abaft the mainmast. Fig. 6, Plate 2, represents a first-rate's double capstan whose parts were as follow :

A was the step in which the spindle worked.
B B the beams under the lower and middle-decks.
C C the planks of those decks.
D the iron-pawl-rim.
E the pawl-rim.
F the lifter for raising the messenger.
G G the chocks.
H H the whelps.
I the trundle-head.
K the barrel.

L the partners.
M the drum-head.
N N the pawls.
O the spindle.

Fig. 7 represents a brig's capstan with its spindle in the step: this was a single capstan and was made smaller than those used in the line-of-battle ships. The drum-head was a broad cylindrical piece of wood, resembling a mill-stone, and fixed on the top of the barrel and whelps. There were a number of square holes cut in it to receive the bars.

The whelps rose out of the main body of the capstan like buttresses, to enlarge the sweep; so that a greater portion of the messenger might be wound about it at one turn, without adding much to the weight of the capstan.

The pawls were two short bars of iron, bolted at one end through the deck to the beams close to the lower part of the whelps, and were bolted to the pawl-rim; the other end, which occasionally turned round on the iron pawl-rim, being fixed on the deck, as the capstan turned, prevented it from recoiling or turning back by any sudden jerk of the cable as the ship rose on the sea, which might greatly have endangered the men who were heaving.

The spindle was shod with iron, and turned round in the saucer, which was a sort of iron socket let into a wooden standard called the step, resting on, and bolted to, the beams.

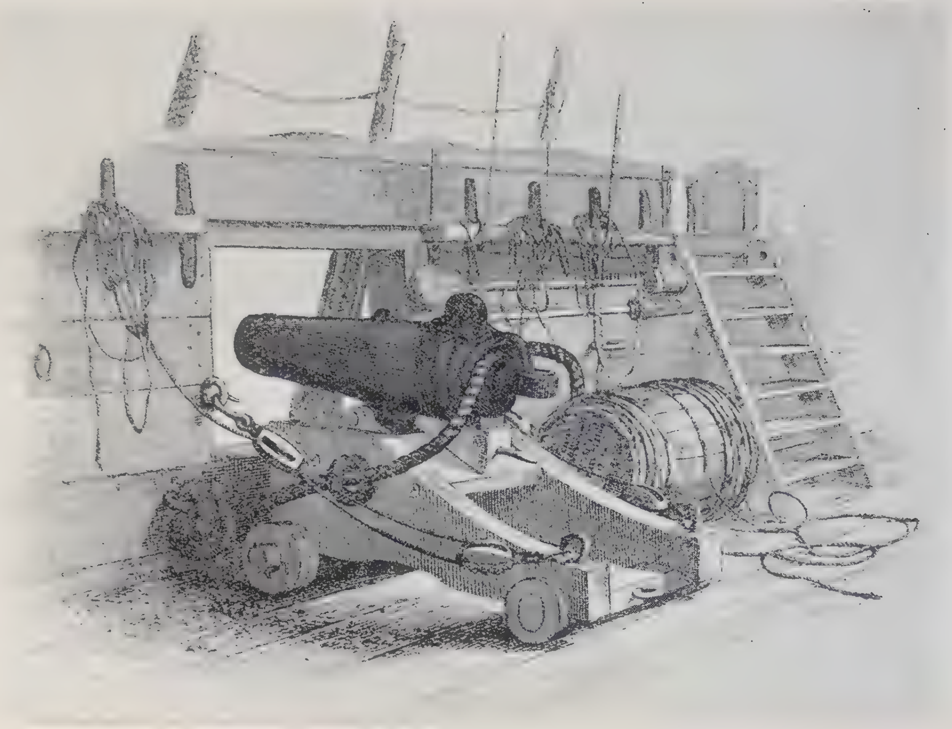
The bars were long pieces of wood, or arms, thrust into a number of square holes in the drum-head, in which they were as the radii of a circle, or the spokes to the nave of a wheel. They were used to heave the capstan round, which was done by the men setting their breasts against them and walking about like the machinery of a horse-mill, till the operation was finished.

There were small iron pins, or bolts, thrust perpendicularly through the holes of the drum-head, and through a corresponding hole in the ends of the bars, made to receive them when the bars were fixed. They were used to confine the bars, and prevent them from working out as the men heaved, or when the ship laboured. Every pin was fastened to the drum-head with a small iron chain; and, that the bars might exactly fit their respective holes, they were all numbered.

CARLINGS; short pieces of timber ranging fore and aft, from one of the deck beams to another, into which their ends were scored: they were used to sustain and fortify the smaller beams of the ship and are represented by G in Plate 4. They were pieces of oak timber, about eight feet long and eight inches square, or more, used for the purpose of framing the partners.

CARRONADE; a short piece of ordnance, much lighter than the common cannon, and having a chamber for the powder like a mortar: from their peculiar construction, they were capable of carrying large balls, and were carried on the upper works, as the poop and forecastle: they were much used in close engagements at sea, mostly in frigates, sloops, and small vessels.

The carronade derived its name from Carron in Scotland, the town in which it was first made; and it was instituted a standard gun in the Navy in June, 1779.



E. W. Cooke, 1828.

A BRIG OF WAR'S 12-POUNDER CARRONADE.

The Length, Diameter of the Bores, and Weight of Carronade.

Nature.		Diameter of the bore in Inches.	Length in			Weight		
			Ft.	In.	Calibre.	Cwt.	qrs.	lbs.
68 Pounders	..	8.05	5	2	7·702	36	0	0
			4	0	5·962	29	0	0
42 ,,	..	6.84	4	3½	7·518	22	1	0
32 ,,	..	6.35	4	0½	7·679	17	0	14
24 ,,	..	5.68	3	7½	7·656	13	0	0
			3	0	6·336	11	2	25
18 ,,	..	5.16	3	3	7·587	9	0	0
			2	4	5·447	8	1	25
12 ,,	..	4.52	2	2	5·778	5	3	10

The following references will serve to explain the different parts of the carronade, as exhibited in Plate 2, Fig. 4.

A. Solid metal, instead of the button of a gun, through which a screw passed to serve as a levelling screw.

B. Metal to confine the rope or hawser.

C, *d*, *d*. Small knobs which marked the line of metal, and by which the carronade was levelled.

CARVEL-WORK ; in contradistinction to clincher-work, the common method of planking vessels ; it was performed by laying the edges close to each other, and caulking them to make them water-tight.

CAT ; a strong tackle used to draw the anchor perpendicularly up to the cat-head, which article see.

CAT-FALL ; the rope that formed the tackle for heaving up the anchor from the water's edge to the bow. It was rove through sheaves at the outer end of the cat-head, and through the sheaves of the cat-block alternately.

CAT-HARPINGS ; small ropes which served to brace in the shrouds of the lower masts behind their respective yards, for the double purpose of making the shrouds more tight, and of affording room to draw the yards in more obliquely, to trim the sails for a side-wind.

CAT-HEADS ; two strong short beams of timber, projecting almost horizontally over the ship's bows, on each side of the bowsprit, being like two radii which extended from a centre taken in the direction of the bowsprit. They are represented by *a* in Plate 5, Fig. 4.

The part of the cat-head which rested upon the forecastle was securely bolted to the beams ; the other projecting part carried at its extremity two or three small wheels, or sheaves, of brass or strong wood, about which a rope called the cat-fall passed, and communicated with the cat-block, which also contained three sheaves.

The cat-head also served to suspend the anchor clear of the bow, when it was necessary to let it go ; it was supported by a sort of knee, which was generally ornamented with sculpture.

CAT-HOOK ; a strong hook fitted to the cat-block, to hook the ring of the anchor when it was to be drawn up or catted.

CEILING ; the inside planks of a ship. See Plate 3, Fig. 1, where the planks of the ceiling are represented by O O.

CHAIN-PLATES ; iron plates bolted to the ship's side, to which the chain and dead-eyes that supported the masts by the shrouds were connected. (See Plate 5, Fig. 4.)

CHAINS; strong links or plates of iron, the lower ends of which were bolted through the ship's side to the timbers.

They were placed at short distances from each other on the ship's outside, being used to contain the blocks, called dead-eyes, by which the shrouds of the masts were extended. The chains and their channels are represented by Plate 3, Fig. 13.

CHANNELS, or Chain-wales; broad thick planks, projecting horizontally from the ship's outside, beginning abreast of, and continuing somewhat abaft each mast. They are represented by I in Plate 7, Fig. 2, and in Plate 5, Fig. 4.

The channels were used to extend the shrouds from each other, and from the axis or middle line of the ship, so as to give greater security and support to the masts, and to prevent the shrouds from rubbing against the gunwale.

Each mast had its chain-wales, which were either built above or below the second deck-ports in a ship of the line: they were strongly connected to the side by knees, bolts, and standards, besides being confined thereto by the chains, whose upper ends passed through notches on the outer edge of the chain-wales, so as to unite with the shrouds above.

CHEEKS; knee pieces of timber, fastened to the ship's bow, and to the knee of the head. In Plate 7, Fig. 2, they are represented by Z Z.

CHEEKS of a block were the two sides of its shell.

CHEEKS of a mast; the faces or projecting parts on each side of the masts, used to sustain the trestle-trees upon which the frame of the top, together with the top-mast, immediately rested : also the head of the mast, being that part above the steps. (See Plate 6, Fig. 1).

CHESS-TREES ; two pieces of wood bolted perpendicularly, one on each side of the ship : they were used to confine the clews of the main-sail, for which purpose there was a hole in the upper part, through which the tack passed that extended the clew of the sail to windward. See the article Tack.

The chess-trees were commonly placed as far before the main-mast as the length of the main-beam.

CHINE ; that part of the water-way which was left above the deck, that the lower seam of the spirketting might more conveniently be caulked. In Plate 3, Fig. 1, N represents the water-way.

CISTERN ; a large wooden trough, placed in the well, just below the orlop, and having a lead pipe, which went through the ship's side, by which it was occasionally filled with sea water, which was thence pumped up to wash the decks, etc. The position of the cistern is shown by T T, in Plate 4.

CLAMPS ; thick planks on the inner part of a ship's side, used to sustain the ends of the beams, and extending from stem to stern, including the whole interior range of the side. They were placed close under each deck, so as to be securely fayed to all the timbers, to which they were fastened by nails driven through the clamp, and penetrating two-thirds of the thickness of the timbers.

The clamps of the lower and second decks were equal in thickness to half the corresponding timbers in that part, and as broad as could be procured. See G, Fig. 1, Plate 3.

Clamps were also small crooked plates of iron, forelocked upon the trunnions of the cannon, to keep them fast upon their carriages: these, however, were more properly termed cap-squares.

Clamps of the latter sort were also frequently used to fasten the masts and bowsprits of small vessels and boats.

CLEATS; pieces of wood of different shapes, used occasionally in a ship, to fasten ropes upon; some had one, and some two arms; others had none, being hollowed in the middle, and were nailed to the deck, or sides, to fasten anything to.

Those intended for the purpose of stopping shores were principally made of elm, not unlike wedges, except that they tapered from one side only; those made for the purpose of fastening rigging were haunched on the back for about one-third their length, the thin end shaped like a duck's bill; they were in general made of oak, but those at the masthead of elm.

Range cleat (Plate 3, Fig. 12) was formed with two arms, one on each side of the centre or middle part, and nailed or bolted to the side, for the purpose of belaying the running rigging to.

Comb cleat (Plate 2, Fig. 14) was straight on the inner edge, and round on the back, having a hollow cavity in the middle. It was used for leading a rope through, or for keeping it in its place.

Mast cleat (Fig. 10) was made with a score to admit a seizing, a long hole in the centre, for an under seizing, and two round holes, by which the seizing might be crossed.

Shroud cleat (Fig. 11) was formed like the range cleat, having two arms, the remaining part being straight and grooved on the edge. It had scores cut towards the extremity for the seizings to lie in, which were naked, and a groove in the part where the shroud lay.

Sling cleat (Fig. 12) was formed with one arm only, and nailed on each side of the slings, on the yards.

Stop cleat (Fig. 13) was nailed on the bowsprit for the gammoning collars, etc., and sometimes on the yard-arms.

Thumb cleat (Plate 3, Fig. 5) was not unlike a sling cleat, with this exception, that it was smaller, and was made for the purpose of hanging anything on. The number of thumb cleats was indefinite, and they were variously fixed in point of strength, according to the strain they had to bear.

Belaying cleat (Fig. 6) was shaped like a range cleat, only smaller, and it was used for belaying the small ropes to.

Girt-rope cleat (Fig. 11) was nailed to the inside of a ship in ordinary, and used for passing a small rope through, for the convenience of hauling a boat forward or aft, as occasion required.

Iron cleat (Fig. 9) was used for belaying the port-tackles to, when the port-lid was hoisted up.

Shoulder cleat (Fig. 8) was commonly used for the same purposes as the stop cleat, except on the yard-arms.

Stanchion cleat (Fig. 7) was fastened to the head and keel of a stanchion in ships in ordinary.

CLEW; of a sail, the lower corners of square sails, but the aftmost only of stay-sails, etc., the other corner being called the tack.

CLEW-GARNETS ; a sort of tackle fastened to the clews of main and fore-sails, to truss them up to the yard.

CLINCHER-BUILT ; was a term applied to a vessel made of clincher-work, which was the disposition of the planks in the side of any boat or vessel, when the lower edge of each plank overlay the next under it, like the slates on the roof of a house. (See Plate 6, Fig. 2).

CLOSE-FIGHTS ; bulk-heads erected fore and aft in the ship, for the men to stand behind in close engagements, and to fire on the enemy.

CLOTHS in a sail ; the breadths of canvas in its whole width.

COACH, or Couch ; a chamber or apartment in a large ship of war near the stern. The floor of it was formed by the aftmost part of the quarter-deck, and the roof of it by the poop : it was generally the habitation of the Captain.

COAMINGS of the Hatches ; certain raised borders about the edges of the hatches of a ship, to prevent the water on the deck from running down into the lower apartments. They are represented by *d d*, in the plan of the deck (Plate 3, Fig. 1 and Plate 4) as enclosing their respective hatchways.

COAT ; a piece of tarred canvas nailed round that part of the masts and bowsprit which joined the deck, or lay over the stem. Its use was to prevent the water from running down between the decks.

There was also a coat for the rudder nailed round the hole where it passed through the ship's counter.

This hole is represented at the upper part of the stern-post (Plate 13, Figs. 1 and 2).

COCKPIT of a ship of war; was near the apartments of the surgeon and his mates, being the place where the wounded men were dressed. It was situated near the after hatchway, and under the lower gun-deck.

COIN, or Quoin; the wedge laid under the breech of a gun, for the purpose of elevating or depressing it at pleasure. See the article Cannon.

COLLAR; the lower part of any of the principal stays of the masts, or the part by which the stay was confined at its lower end. Thus the collar of the main-stay connected the lower end of the stay to the ship's stem. See the article Stay.

Collar, a rope formed into a wreath, with a heart or dead-eye seized in the bight, to which the stay was confined at the lower part.

COMPANION-LADDER, in ships of war; denoted the ladder by which the officers ascended to, or descended from, the quarter-deck.

CONDUCTOR, Marine; a thick metal wire, rather thicker than a goose's quill, generally of copper, extending from above the main-top-gallant truck, downwards, into the water. They reached two or three feet above the main-mast, and continued down in any convenient direction, so as always to touch the sea-water.

Chains were formerly used for the preservation of ships; but, as the electricity did not readily pass through the links of them, they were superseded by copper wire, which was in general use at the end of the 18th century.

COPPERED, or a copper-bottomed vessel; a vessel sheathed with thin sheets of copper, which prevented the worms eating into the planks, or filth accumulating on the bottom, whereby a ship was made to sail heavily. The *Alarm* frigate was the first ship ever coppered in the British Navy, in 1758; and, in the course of the war with America, which ended in 1783, ships of every class were coppered. See the article Sheathing.

COUNTER; an arc or vault, whose upper part was terminated by the bottom of the stern, and the lower part by the wing-transom and buttock, being referred to from the article Quarter.

There was also another counter above, parallel to this, but not vaulted, which extended from the top part of the lower counter, to the bottom moulding of the cabin or ward-room windows.

Counter-timbers were those short timbers in the stern, put in for the purpose of strengthening the counter.

CRAB; a sort of wooden pillar, whose lower end, being let down through a ship's decks, rested upon a socket like the capstan; it had, in its upper end, three or four holes, at different heights through the middle of it, above one another, into which long bars were thrust, whose length was nearly equal to the breadth of the deck. It was employed to wind in the cable, or to purchase any other weighty matter which required a great mechanical power; but not being so convenient, it was generally laid aside by the end of the 18th century, except in rope-walks, etc. This differed from a capstan in not being furnished with a drum-head, and by having the bars passing right through it, reaching from one side of the deck to the other; whereas those of the capstan, which were superior in number, reached only about eight inches or a foot into the drum-head, according to the size of it. This machine is represented in Plate 2, Fig. 8, and in Plate 3, Fig. 19.

CRANE-LINES; lines going from the upper end of the sprit-sail-topmast to the middle of the fore-stays. They served to keep the sprit-sail-topmast upright and steady in its place, and to strengthen it.

CRANKS; iron braces which supported the lanterns on the poop-quarters, etc.

CRINGLE; a small hole formed in the bolt-rope of a sail, by intertwisting the strand of a rope alternately round itself, and through the strands of the bolt-rope, till it became three-fold and assumed the shape of a ring. In Plate 3, Fig. 20, *a b* represents part of the bolt-rope of a sail, and *c* the cringle.

The use of the cringles was generally to receive the ends of the ropes which were fastened to them for the purpose of drawing up the sail to its yard, or of extending the leech by the bowline-bridles, etc.

Iron-cringles, or Hanks, were open at the lower part to go over the stays; they were made broader in the middle than at the ends, which caused them to spring to their shape; the ends were drawn out fine, and turned into a small ring, for securing the head of the sail by the seizing. These hanks were mostly used to the fore-sails of vessels with one mast.

CROSS CHOCKS ; pieces of timber fayed across the dead-wood in midships, to make good the deficiency of the heels of the lower futtocks.

CROSS-JACK (pronounced crojeck) ; the lower yard on the mizzen-mast, which was hence called the cross-jack-yard, to the arms of which the clews of the mizzen-topsail were extended.

CROSS-JACK-SAIL ; a small sail bent to that yard, but, as it was found of little service, it was very seldom used.

CROSS-TREES ; certain pieces of oak timber, supported by the cheeks and trestle-trees, at the upper ends of the lower and top-masts, athwart which they were laid, to sustain the frame of the tops on the one, and extend the top-gallant shrouds on the other. They were let and bolted to the trestle-trees. In Plate 6, Fig. 5, the cross-trees are represented by *l l*.

CROTCHES ; the crooked timbers that were placed upon the keel in the fore and after parts of a ship, upon which the frame of her hull grew narrower below, as it approached the stem forward, and the stern-post aft.

Crotches were also pieces of wood or iron, whose upper part opened into two horns or arms, like a half-moon. They were fixed in different parts of a ship, according to the uses for which they were designed, which was usually to support booms, spare topmasts, yards, etc.

CROW-FOOT ; a complication of small cords spreading out from a long block, like the smaller parts which extend from the backbone of a herring. (See

Plate 3, Fig. 14). It was used to suspend the awnings, or to prevent the top-sails from getting under the top rim.

CRUTCH; a support for the main-boom of a sloop, brig, or cutter, etc., and for the driver-boom of a ship, when their respective sails were furled.

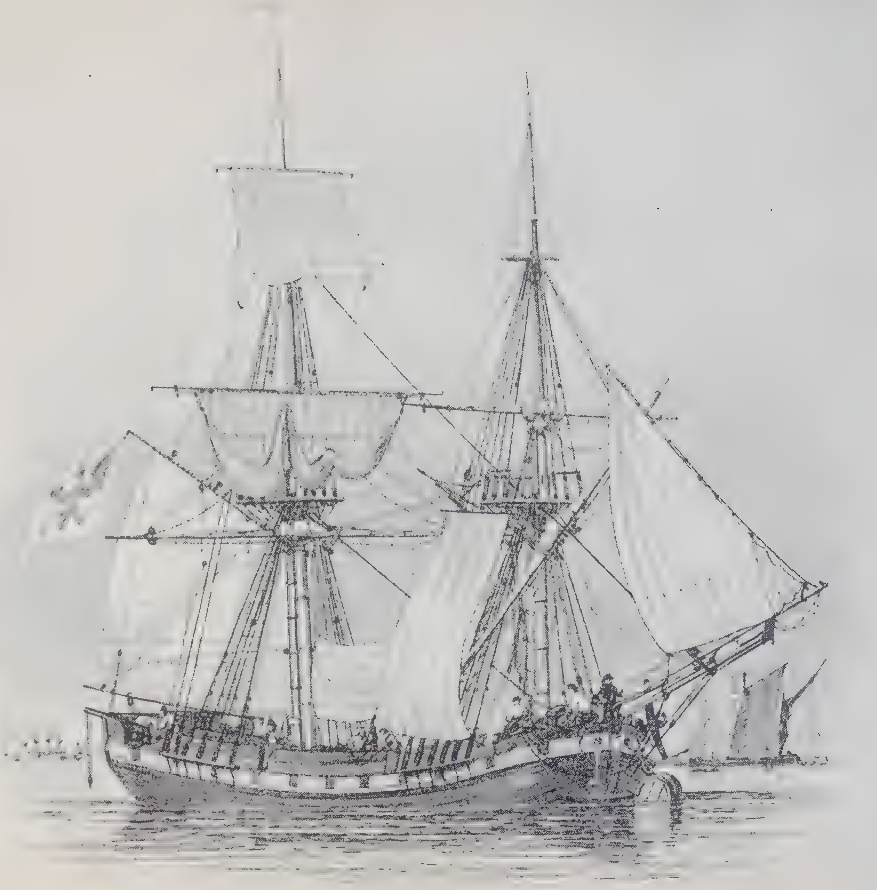
Crutches, in shipbuilding, were pieces of knee-timber, placed within side the ship, for the security of the cant-timbers aft.

CUTTER; a small vessel commonly navigated in the English Channel, furnished with one mast, and a straight running bowsprit, that could be run in on the deck occasionally; except which, and the largeness of their sails, they were rigged much like sloops. For a representation of a cutter, see Plate 16, Fig. 6.

CUT-WATER, or Knee of the Head; the foremost part of a ship's prow, formed of an assemblage of several pieces of timber, to render it broad at the upper part, where it projected forward from the stem to open the column of water as the ship sailed along, and also to make her keep to windward better, when she was close-hauled. See the article Stem, and the several parts of it in Plate 7, Fig. 1.

D

DAVIT; a piece of timber, represented by *a a*, Plate 3, Fig. 22, and used as a crane to hoist the flukes of the anchor to the top of the bow, without injuring the planks of the ship's side as it ascended. The anchors being situated on both bows, the davit could be shifted to either side of the ship, according



E. W. Cooke, 1828.

PRUSSIAN SNOW

to the position of that anchor on which it was to be employed. The inner end of the davit was fixed in the fore channel, *b*, and secured by cants, to prevent the heel from sliding out of its place. A bolt, called the fish-tackle eye-bolt, was driven into the sheer strake, abaft the step of the side. Upon the outer end of the davit was hung, a large block, *c*, through which a strong rope passed, called the fish-pendant, *d*, to the foremost end of which was fitted a large iron hook, *e*, and to its after end a tackle or complication of pulleys, *f*; the former of which was called the fish-hook, and the latter the fish-tackle.

DEAD DOORS; in shipbuilding, were those fitted to the outside of the quarter-gallery-doors, in case the quarter-gallery should be carried away.

DEAD-EYE; a sort of round flattish wooden block, represented in Plate 1, Fig. 15. It was usually encircled with a rope, or with an iron band (see *g*, Plate 3, Fig. 21) and pierced with three holes, through the flat part, in order to receive a rope called the lanyard, *h*, which, corresponding with three holes in another dead-eye, *i*, created a purchase employed for various uses, but chiefly to extend the shrouds or stays, otherwise called the standing rigging.

In order to form this purchase, one of the dead-eyes was fastened in the upper link of each chain in the ship's side, which was made round to receive and encompass the hollowed outer edge of the dead-eye. After this the lanyard was passed alternately through the holes in the upper and lower dead-eyes, until it became six-fold; and was then drawn tight by the application of mechanical powers.

The dead-eye used for the stays had only one hole, which, however, was large enough to receive ten or twelve turns of the lanyard ; it was generally termed a heart, and is shown in Plate 1, Fig. 16.

Crow-feet Dead-eyes were long cylindrical blocks, with a number of small holes in them, to receive the legs or lines of which the crow-foot (see this article, and Plate 3, Fig. 14) was composed. It was generally termed an euphroe, and is represented by Plate 1, Fig. 21.

DEAD-WOOD ; certain blocks of timber laid upon the keel, particularly at the extremities fore and aft, where these pieces were placed upon each other to a considerable height, because the ship was there so narrow as not to admit of the two half timbers, which were therefore scored into the dead-wood, where the angle of the floor-timbers gradually diminished, as approaching the stem and stern-post. The dead-wood is represented by F in Plate 7, Fig. 1, and by L in Plate 3, Fig. 1.

In the fore part of the ship, the dead-wood generally extended from the stemson, upon which it was scarphed to the loof-frame ; and in the after end from the stern-post, where it was confined by the knee, to the after-balance-frame. It was connected to the keel by strong spike-nails.

The dead-wood fore and aft was equal in depth to two-thirds the depth of the keel, and as broad as could be procured, so as not to exceed the breadth of the keel.

DECKER ; related to the rate of a ship of force, as a two or three-decker—*i.e.*, which carried two or three entire tiers or ranges of cannon.

DECKS; the planked floors of a ship, which connected the sides together, and served as different platforms to support the artillery and lodge the men, as also to preserve the cargo from the sea and rain.

As all ships were broader at the lower deck than at the next above it, and, as the cannon thereof were always heavier, it was necessary that the frame of it should be much stronger than that of the others; and, for the same reason, the second, or middle-deck, had to be stronger than the upper-deck or forecastle.

First and second-rate ships were furnished with three whole decks, reaching from the stem to the stern, besides a forecastle and quarter-deck; the former extending aft from the belfry, and the latter forward from the stern to the gangway, a vacancy being left in the middle, which opened to the upper deck, and formed what was called the waist.

The inferior ships of the line of battle were equipped with two decks and a half; and frigates, sloops, etc., with one gun-deck and a half, and with a spar deck below, to lodge the crew.

The decks were sustained by the beams, clamps, the water-ways, the carlings, the ledges, the knees, and two rows of stanchions, etc. See those articles.

That the figure of a deck, together with its corresponding parts, may be more clearly understood, we have exhibited a plan of the lower-deck of a 74-gun ship in Plate 4. And, as both sides of the deck were exactly similar, the pieces by which it was supported appear on one side, and on the other side the planks or floor of which it was composed, as laid upon those pieces.

Explanation of the principal figures represented in the deck :

A, the principal, or main hatch-way.

B, the stern-post.

C, the stem.

D, the beams, composed of three pieces, in one of which the dotted lines show the arrangement of one of the beams under the other side of the deck.

E E, the plate knee, which is represented in Plate 2, Fig. 5.

F F, the horizontal ears, or lodging knees, with bolts, which fastened the beam to the side, as shown in Plate 2, Fig. 5.

G, the carlings, ranging fore and aft, from one beam to another.

H, the ledges let into the carlings.

I, the pump-dale, being a large wooden tube which returned the water from the pumps into the sea.

K, the prong or forked beams ; being curved pieces of timber serving as half beams to support the decks, where whole beams could not be placed on account of the hatchways.

L, the wing-transom, which was bolted by the middle to the stern-post, and the ends let into the fashion-pieces.

M, the manger-boards, which enclosed the manger, and prevented the water that entered the hawse-holes from running aft between the decks.

N N, the fore hatch-way.

O O, the after hatch-way.

P, the step for the jear-capstan.

P *p*, the step for the main-capstan.

Q, the wing-transom-knee.

R, the chock under the beam, shown in Plate 2, Fig. 5.

S, the lower-deck hook.

T T, the cistern for the chain-pumps.

V, the breadth and thickness of the timbers at the height of the gun-deck.

U, the scuttles leading to the gunners' store-room.

u, the scuttle leading to the bread-room.

W, the station of the fore-mast.

X, the station of the main-mast.

Y, the mizzen-step.

Z, the ring-bolts of the decks, used to retain the cannon whilst charging.

a a, the ring-bolts of the sides into which the tackles were hooked that secured the cannon at sea.

c a a d, the water-ways, through which the scupper-holes were pierced, to carry the water off from the deck into the sea.

b b, plan of the aftmost and foremost cable-bits, with their cross-pieces *g g*, and their standards *e e*.

Thus we have represented on one side, all the pieces which sustained the deck with its cannon; and, on the other side, the deck itself, with a tier of 32-pounders planted in battery on it. In order also to show the use of the breeching and train-tackle, one of the guns is drawn in, as ready for charging. See the articles Breeching and Cannon.

The number of beams by which the decks of ships were supported, was often very different, according to the practice of different countries, the strength of the timbers of which the beams were framed, and the service for which the ship was calculated.

Lower gun-deck, in first- and second-rate ships, referred to the first deck, whose frame was made broader and stronger than either of the other decks: it was laid next the orlop, and sustained the heaviest tiers of guns, as 32-pounders.

Middle-deck, was the second deck, and lay between the lower and upper decks: it was slighter in its construction than the lower deck, and sustained the second tiers of guns, as 18-pounders.

Upper-deck, or main-deck, was the third deck, and sustained the third tier of guns, as 12-pounders: it was constructed much slighter than the middle-deck, and, in third-rate ships, was called the second-deck.

Quarter-deck, was that above the upper-deck, reaching forward from the stern to the gangway, and supported the carronades, etc.

Gun-deck, in frigates, sloops of war, brigantines, gun-brigs, and cutters, was the main or upper-deck, whereon the guns were placed in batteries.

Flush-deck, or deck-flush, fore and aft, in corvettes, etc., implied a continued floor laid from stem to stern upon one line, without any stops or intervals.

Half-deck, was the under part of the quarter-deck of a ship of war, contained between the foremost bulkhead of the cabin or ward-room, and the break of the quarter-deck.

Spar-deck, in frigates and men-of-war converted into troop ships, was that continued in a straight line from the quarter-deck to the forecastle, and appropriated for the reception of spars, etc., under which the hammocks were stowed away, and the crew slept.

For Forecastle, Orlop and Poop, see each article under its respective head.

DEEP-WAISTED; the distinguishing fabrics of a ship's decks, when the forecastle and quarter-deck were elevated from four to six feet above the level of the upper or main-deck, so as to leave a vacant space, called the waist, in the middle of the upper-deck.

DOG-VANE ; a small vane composed of thread, cork, and feathers, fastened on the end of a half-pike, and placed on the weather gunwale, to steer the ship by when sailing on a wind.

DOLPHIN of the Mast ; a kind of wreath, formed of plaited cordage, to be fastened occasionally round the masts, as a support to the puddening ; the use of which was, to sustain the weight of the fore and main-yards by the jears, in case the rigging or chains, by which those yards were suspended, was shot away. See the article Puddening.

DOLPHIN-STRIKER ; a boom or spar directed downwards from the cap of the bowsprit, through which was rove a stay or martingale, to support the jib-boom. (See Plate 15, No. 6).

DRABLER ; an additional part of a sail, sometimes laced to the bottom of the bonnet on a square-sail, in sloops or schooners.

DRIVER ; a large sail occasionally set upon the mizzen-yard or gaff, the foot of it being extended by a boom considerably over the stern, in the manner of a cutter's main-sail. It was sometimes fitted to hoist with a half-yard to the peak, like a lower studding-sail, and the fore leech was laced down the mizzen-mast.

Driver also signified the foremost spur in the bulge-ways, the heel of which was fayed to the fore side of the foremost puppet, and the sides placed to look fore and aft.

E

EARINGS, in a ship; certain small ropes employed to fasten the upper corners of a sail to its respective yard; for which purpose one end of the earing was spliced to the cringle, fixed in that part of the sail, and the other end was passed six or seven times round the yard-arm and through the cringle, thereby fastening the latter to the former; the two first turns, which were intended to stretch the head of the sail tight along the yard, were passed beyond the lift and rigging on the yard-arm, and were called outer turns, while the rest which drew it close to the yard, and were passed within the lift, etc., were called inner turns. Every reef on a yard had its respective earings, which were passed in the same manner.

Reef-earings. The only difference between earings and reef-earings was that the former was spliced to the cringle, and the latter rove through the cringle, having an eye spliced in it for the more easy reeving and unreeving of it, in case it was chafed, that another might easily replace it for fear of splitting the sail.

EKEING; in shipbuilding, a piece fitted to make good a deficiency in length, as the lower part of the supporter under the cat-head, etc., likewise the piece of carved-work under the lower end of the quarter-piece, at the after part of the quarter-gallery.

ENSIGN; a large flag, or banner, hoisted on a long pole erected over the poop, and called the ensign-staff.

The ensign was used to distinguish the ships of different nations from each other, as also to characterise the different squadrons of the navy.

The British ensign, in ships of war, between the years 1606 and 1801, was known by a double cross—viz., that of St. George and St. Andrew, formed into an union, upon a field which was either red, white, or blue.

ENTRANCE ; a name frequently given to the foremost part of a ship under the surface of the sea.

ESCUTCHEON ; the compartment in the middle of the ship's stern, where her name was written. It was more peculiar to the French and other foreigners, than to English-built vessels.

EYE of a block-strap ; that part by which it was fastened, or suspended, to any particular place upon the sails, masts, or rigging, the eye of which is shown in Plate 3, Fig. 16. The eye was sometimes formed by making two eye-splices on the ends of the strap, and then fastening them together with a small line, so as to bind round a mast, yard, or boom, as occasion required. See Plate 3, Fig. 17.

Eye of a stay, was that part of a stay which was formed into a sort of collar to go round the mast-head. See the article Stay.

Eye-bolt ; a long bar of iron with an eye in one end of it. It was formed to be driven into the decks or sides of a ship, for the purpose of fastening ropes or hooking tackles to.

Flemish Eye, was a phrase particularly applied to the eye of a stay, which was either formed at the making of the rope, or by dividing the yarn into two equal parts, knotting each pair separately, and pointing the whole over.

Eye-let holes. See the article Sail.

Eye of a shroud; the upper part which was formed of a sort of collar to go over the mast-head. See Plate 8, Fig. 4.

Eyes of a ship; a name frequently given to those parts which lay near the hawse-holes, particularly in the lower apartments within the vessel.

F

FAG-END of a rope; the end which was becoming untwisted and loosened by frequent use. To prevent this, the ends of ropes were wound round with a piece of twine, or pack-thread, which operation was termed whipping.

FALLING-HOME; amongst shipwrights, was a term generally applied to the upper part of the top side, when it was very much within a perpendicular. (See Plate 3, Fig. 1.)

FALSE-KEEL of a ship, was composed of several pieces, and fitted under the main keel, to preserve it from friction, and to make the ship hold a better wind; it was generally formed of elm. In such ships as were not intended to be in harbours frequently, where they grounded, the false keel was slenderly secured, so that if, by accident, the ship should take the ground, it might, by coming off, be of some assistance in saving her.

FASHION-PIECES; in shipbuilding, were the aftmost or hindmost timbers of a ship, which terminated the breadth, and formed the shape of the stern; they were united to the stern-post and to the extremity of the wing-transom by a rabbet and a number of strong nails or spikes driven from without. See their connection with the stern-post and transom, as explained under the articles Stern and Naval Architecture.

FERRULE; a small iron hoop fixed on the extremities of the yards, booms, etc.

FID, or Mast-fid; a square bar of wood or iron, with a shoulder at one end. It was used to support the weight of the top-mast, when erected at the head of the lower-mast, by passing through a mortise or hole at the lower end of the former, and resting its ends on the trestle-trees, which were sustained by the head of the latter: the fid, therefore, had to be withdrawn every time the top-mast was lowered. The top-gallant-mast was retained at the head of the top-mast in the same manner. See the article Mast.

FIGURE-HEAD; see the article Head.

FILLING a ship's bottom; the act of driving a number of nails with broad heads into her, so as to give her a sheathing of iron, to prevent the worms from getting into the wood: this method was little used at the end of the 18th century, the sheathing with sheets of copper having been found superior to it. See the article Coppered.

Fillings; in shipbuilding, were small pieces of timber used for the purpose of making the curve fair for the mouldings, between the edges of the fish-front, and the sides of the mast.

FINISHING; in shipbuilding, the carved ornaments of the quarter-gallery; those below the second counter were called the lower-finishing, and those above the upper-lights the upper-finishing. See Plate 13, Fig. 1, and Plate 7, Fig. 2, where the lower-finishing is represented by L, and the upper-finishing by M.

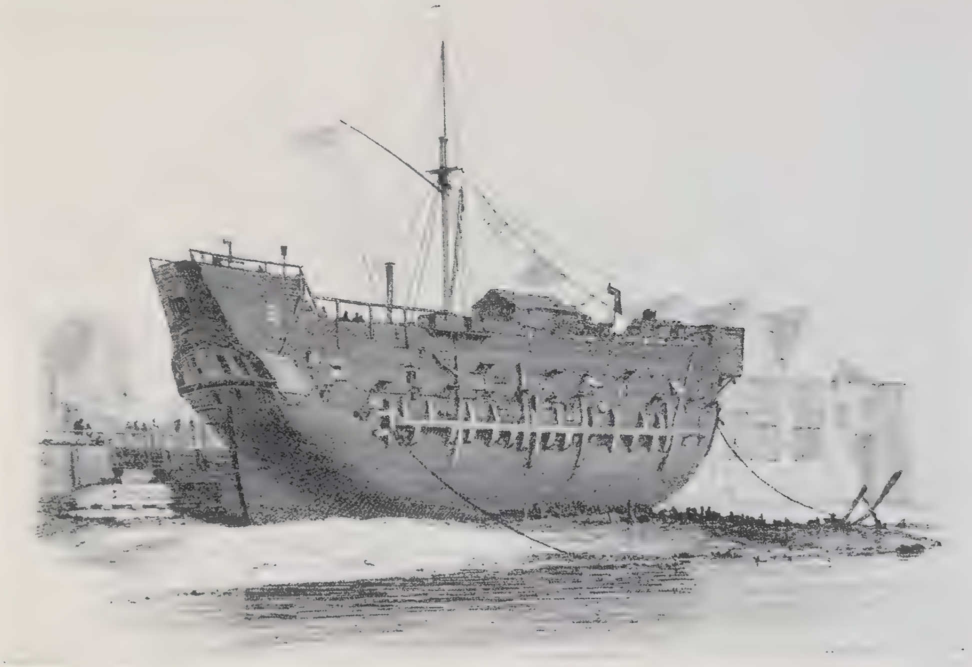
FIR-TIMBER; in mast-making, was the most useful wood for length, size, and lightness. It formed the body of the mast, the spindle, side-trees, fishes, cheeks, fillings, and cant-pieces. Masts were also made of single trees, as were yards, booms, top-masts, etc.

FIRE-RAIL; in shipbuilding, a rail fixed above the plank-sheer on the forecastle and quarter-deck, worked similar to the plank-sheer.

FISH; a machine employed to hoist and draw up the flukes of the ship's anchor towards the top of the bow, in order to stow it after it had been catted. It was composed of four parts—viz., the pendant, the block, the hook, and the tackle—which, with their respective uses are described under the article Davit, and represented in Plate 3, Fig. 22.

FLOOR; the bottom of a ship, or all that part on each side of the keel which approached nearer to an horizontal than a perpendicular position, and on which she rested when aground.

Floor-timbers, were those parts of a ship's timbers which were placed immediately across the keel, and upon which the bottom of the ship was framed; to these the upper parts of the timbers were united, being only a continuation of the floor-timbers upwards. The floor-timbers are represented by V in Plate 3, Fig. 1.



E. W. Cooke, 1828.

THE "DISCOVERY." CONVICT-SHIP (LYING AT DEPTFORD).

The Vessel which accompanied Captain Cook on his Last Voyage.

FOOT of a mast; was the lower end, or that which went into the step, as shown in Plate 6, Fig. 9.

Foot of a sail, referred to the lower edge or bottom.

Foot-rope, the rope to which the lower edge of the sail was sewn. See the article Bolt-rope.

Foot-ropes was also another name for the Horses of the yards, which article see.

FOOTSPACE-RAIL; that rail in the balcony in which the balusters stepped.

FOOT-WALING; the whole inside planks or lining of a ship, used to prevent any part of the ballast or cargo from falling between the floor timbers. See the article Midship-section.

FORECASTLE; a short deck placed in the forepart of a ship, above the upper deck; it was usually terminated both forward and aft, by a breastwork in vessels of war, the foremost part forming the top of the beak-head, and the after part reaching to the after part of the fore-chains.

FORE-CAT-HARPINGS; a complication of ropes used to brace in the upper part of the fore-shrouds. See the article Cat-harpings.

FORE-FOOT; a piece of timber which terminated the keel at the fore end. It was connected by a scarph to the extremity of the keel, of which it formed a part; and the other end of it, which was curved upwards into a sort of knee, was attached to the lower end of the stem; of which it also formed a part, being also called a gripe.

As the lower arm of the fore-foot lay on the same level as the keel, so the upper one coincided with the middle line of the stem: its breadth and thickness, therefore, corresponded with the dimensions of those pieces, and the heel of the cut-water was scarphed to its upper end.

FORE-HOOKS; the same as Breast-hooks, which article see.

FORE-LOCK; a little flat-pointed wedge of iron, used to drive through a hole in the end of a bolt, to retain it firmly in its place and prevent its drawing. See the article Bolt.

FORE-MAST; see the article Mast.

FORE-JEARS; see the article Jears.

FORE-SAIL; see the article Sail.

FORE-SHROUDS; see the article Shrouds.

FORE-STAY; see the article Stay.

FORE-TOP; see the article Top.

FORE-TOP-GALLANT-MAST; see the article Mast.

FORE-TYE; see the article Tye.

FORE-YARD; see the article Yard.

FRAME; see the article Timber.

FREEZING, or Frieze; a sort of ornamental painting on the upper part of a ship's quarter, stern, or bow. It generally consisted of armour, instruments of war, marine emblems, etc.

FRIGATE ; in the navy, a light nimble ship, built for the purpose of sailing swiftly. These vessels mounted from 20 to 50 guns, and were considered excellent cruisers.

FUTTOCKS ; the middle division of a ship's timbers ; or those parts which were situated between the floor and the top-timbers : those next the keel were called the ground-futtocks, and the rest upper-futtocks. See the article Timbers.

FUTTOCK-PLATES ; certain iron plates, the upper parts of which were open like a ring, to fix the dead-eyes in ; and round holes were punched at the lower end of these plates for the futtock-shrouds to hook in, or for bolts to be driven through when used for the lower shrouds.

FUTTOCK, or Foothook-stave ; a short piece of rope served over with spun-yarn, to which the shrouds were confined at the cat-harpings.

The futtock-staves were seized along the lower shrouds horizontally, as much below the upper-side of the trestle-trees as the cap was above ; a spar was then lashed to the outside of the shrouds, and about six feet below the futtock-stave, and a single block lashed round each shroud and spar (except the fore and after shrouds) so that all came in together : the swifting-line was then rove through each block, from side to side, beginning in the middle, one end leading aft, the other forward ; it was then crossed, and rove through two leading blocks, one on each side of the deck, and was boused taut till the shrouds came into the length of the cat-harping-legs, which were seized at each end, round the futtock-stave and shroud.

G

GAFF; in small ships, a sort of boom used to extend the upper end of the mizzen, and always employed for the same purpose on those sails whose foremost edges were joined to the masts by hoops or lacings, and which were usually extended by a boom below: such were the mainsails of all sloops, brigs, and schooners.

The foremost end of the gaff was furnished with two cheeks forming a semi-circle, which enclosed the after part of the mast, so as to confine the gaff to its respective mast whilst the sail was hoisting or lowering. It was further secured in this situation by a rope passing from one side of the cheeks to the other on the fore side of the mast; and to prevent the friction of this rope upon the mast, by hoisting or lowering, several little wooden balls, called trucks, were hung upon it, in the same manner as beads thread upon a necklace.

GALLERY; a balcony which projected from the stern or quarter of a ship of war, or of a large merchantman. The stern-gallery was wholly at the stern of a ship and was usually decorated with a balustrade, extending from one side of the ship to the other; the fore part was limited by a partition called the skreen-bulk-head, in which were framed the cabin windows; and the roof of it was formed by a sort of vault, termed the cove, which was frequently ornamented with sculpture. See the article Stern.

The quarter-gallery of a ship of 74-guns is shown in Plate 5, Fig. 1. It was that part which projected on each quarter and was generally fitted up as a water-closet.

Ships of 20-guns and upwards on one deck had quarter-galleries, but no stern-gallery; two and three deckers had quarter-galleries, with their proper conveniences, and one or two stern galleries.

GAMMONING the Bowsprit; the act of binding the inner quarter of the bowsprit close down to the ship's stem, in order to enable it the better to support the stays of the foremast, and carry sail in the fore part of the vessel. This was performed by passing seven or eight turns of a rope over the bowsprit, and through a large hole called the gammoning-hole, in the stem or knee of the head alternately: afterwards all the turns were drawn as firm as possible, the opposite ones being braced together under the bowsprit by a frapping, as shown in Plate 5, Fig. 2.

GANGWAY; a narrow platform or range of planks, laid horizontally along the upper part of a ship's side, from the quarter-deck to the forecastle, and peculiar to ships that were deep-waisted for the convenience of walking more expeditiously fore and aft, than by descending into the waist. It was fenced on the outside by iron stanchions, and ropes or rails, extending from one to the other; and in vessels of war with a netting in which part of the hammocks were stowed. This was frequently called the Gang-board in merchant vessels.

GARBOARD-STRAKE; the first range or strake of planks laid upon a ship's bottom next to the keel, throughout the whole length of the floor. The edge of this plank was let into a groove or channel in the side of the keel, which was called the rabbet of the garboard-strake. (See Plate 3, Fig. 1.)

Shot-GARLAND ; a piece of timber nailed horizontally along the ship's side, from one gun-port to another, and filled with several hemispherical cavities, to contain the round-shot, ready for charging the great guns in time of action.

GASKET ; a sort of plaited cord fastened to the sail-yards of a ship, and used to furl or tie up the sail firmly to the yard, by wrapping it round both six or seven times, the turns being at a suitable distance from each other.

Bunt-gasket, was that which supported or tied up the bunt of the sail, and was consequently the strongest, as having the greatest weight to support.

Quarter-gasket, was only used for large sails, and fastened about half way out upon the yard, which part was called the quarter.

Yard-arm Gasket, was made fast to the yard-arm, and served to bind the sail as far as the quarter-gasket on large yards, but extended quite into the bunt of small sails.

GEARS ; see the article Jears.

GOODGEONS, Gudgeons, or Braces ; certain clamps of iron, or other metal, bolted on the stern-post of a ship, on which to hang the rudder, for which purpose there was a hole in each of them, to receive a corresponding pintle, bolted on the back of the rudder, which turned thereby as upon hinges. There were generally four, five, or six goodgeons and pintles on a ship's stern-post and rudder, according to her size, and upon these the rudder was supported, and traversed from side to side, as a door upon its hinges. See the article Helm, and Plate 5, Fig. 1.

GOOSE-NECK ; a sort of iron hook fitted on the inner end of a boom, and introduced into a clamp of iron, or eye-bolt, which encircled the mast, or was fitted to some other place in the ship, so that it might be unhooked at pleasure.

GOOSE-WINGS of a Sail ; the clews or lower corners of a ship's main-sail or fore-sail, when the middle part was furled or tied up to the yard.

The goose-wings were only used in a storm, to scud before the wind, when the sail, even diminished by a reef, was too great a pressure on the ship.

GORING, or Goring-cloth ; that part of the skirts of a sail, where it gradually widened from the upper part or head, towards the bottom or foot : the goring-cloths, therefore, were those which were cut obliquely, and added to the breadth. See the article Sail.

GRIPE ; the same as the Fore-foot, which article see.

GRIPES ; a machine formed by an assemblage of ropes, hooks, and dead-eyes, and used to secure the boats upon the deck of a ship at sea, and prevent them from being shaken by the labouring of the vessel. The hooks which were fastened at their ends, were fixed to ring-bolts in the deck on each side of the boat ; whence passing over her middle and extremities, they were fastened by means of the dead-eyes, so as to render the boats firm and secure.

GROMMET ; a sort of ring, or small wreath, formed of a strand of rope, laid in three times round and used to fasten the upper edge of a sail to its stay, in different places, by means of which the sail was accordingly hoisted or lowered. See also the article Hanks.

GUARD-IRONS; curved bars of iron placed over the ornamental figures on a ship's head or quarter, to defend them from injury.

GUDGEONS; see the article Goodgeons.

GUN; a general name, under which were included almost every kind of fire-arm; mortars and pistols being practically the only kinds excepted from this nomination.

In the navy, gun was generally considered synonymous with cannon (which article see), and distinguished by the name great gun, from the small guns, as fire-locks, muskets, carbines, blunderbusses, fowling-pieces, etc. Under this single denomination was comprised all ordnance, from the 42-pounder, the heaviest, down to a swivel.

The following table gives the calibre of English and foreign guns, expressed in English inches:

ENGLISH.		FRENCH.		SPANISH.		DUTCH.		RUSSIAN.		PORTUGUESE.	
Pr.	Inc.	Pr.	Inc.	Pr.	Inc.	Pr.	Inc.	Pr.	Inc.	Pr.	Inc.
42	7.02	—	—	—	—	—	—	36	6.86	48	7.49
32	6.41	36	6.90	36	6.84	32	6.40	30	6.47	36	6.80
24	5.82	24	6.03	24	6.03	24	5.92	24	6.00	24	5.93
18	5.29	16	5.26	18	5.52	18	5.45	18	5.45	18	5.40
12	4.62	12	4.78	12	4.80	12	4.76	12	4.76	12	4.70
9	4.20	8	4.18	9	4.20	8	4.13	8	4.17	9	4.30
6	3.67	—	—	—	—	6	3.78	6	3.78	6	3.75
4	3.20	4	3.32	—	—	—	—	—	—	—	—
3	3.91	—	—	—	—	—	—	—	—	—	—
1	2.02	—	—	—	—	—	—	—	—	—	—

A truly fortified gun measured eleven diameters of the bore at the circumference of the base-ring, nine diameters at the trunnions, and seven at the circumference of the muzzle-ring.

A truly fortified brass gun measured two diameters less at each place of measurement than the iron gun.

The trunnions were placed at a distance of three diameters from the base-ring; thus there remained four diameters in distance from the muzzle.

The carriage was five-eighths the length of the gun.

The relationship between the size of the bore and the size of the shot for that gun was as twenty to nineteen.

The thickness of the metal of a gun at the vent was one diameter and a quarter of the bore. See also the article Carronade.

GUN-TACKLE; the ropes, blocks, etc., affixed to each side of the carriage; their use was to run the guns out of the ports, and to secure them to the ship's side in bad weather. See Plate 3, Fig. 1.

GUNWALE, or Gunnel; was that piece of timber which reached on either side of the ship, from the half-deck to the forecastle, being the uppermost bend, which finished the upper work of the hull in that part in which were put the stanchions that supported the waist-trees. This was called the gunwale whether there were any guns in the ship or not. The gunwale is represented by *c* in Plate 3, Fig. 1. The lower part of any port, where any ordnance were, was also called the gunwale.

GUY; the name given to a tackle, used to confine a boom forward when a vessel was going large, and to prevent the sail from gybing, by any sudden change of the wind or course.

H

HAIR-BRACKET; the moulding which came at the back of the figure, and broke in with the upper cheek.

HALF-PORTS ; shutters made of slit-deal, to fit the ports, with a hole cut for the muzzle of a gun to pass through.

HALF-TIMBERS ; those timbers in the cant-bodies which were answerable to the lower futtocks in the square body.

HALYARDS ; the ropes or tackles usually employed to hoist or lower any sail upon its respective mast or stay, except the cross-jack and sprit-sail-yards, which were always slung ; but in small vessels the sprit-sail had halyards. See the article Jears.

HANKS ; wooden rings fixed upon the stays at different distances, to confine the stay-sails to them. They were used in lieu of grommets, being of a later invention and much more convenient, and were framed by the bending of a tough piece of wood into the form of a wreath, and fastened at the two ends by means of notches, thereby retaining their circular figure and elasticity ; whereas the grommets, which were formed of rope, were apt to relax in warm weather and adhere to the stays, thus preventing the sails from being readily hoisted or lowered. See the articles Grommet and Cringle.

HARPINGS ; the fore parts of the wales which encompassed the bow of a ship, and were fastened to the stem, being thicker than the after part of the wales, in order to reinforce the ship in this place, where she sustained the greatest shock in plunging into the sea.

HATCH, or Hatchway ; a square or oblong opening in the deck of a ship, of which there were several, forming the passages from one deck to another and into the hold or lower apartments. See the article Deck, and Plate 4, where A represents the main-hatchway of the lower deck; N N, the fore hatchway; and O O, the after hatchway.

The after hatchway was placed between the main and mizzen-masts.

The fore hatchway stood a little abaft the foremast, or in large vessels at the break of the forecastle.

The main hatchway was placed just before the mainmast, and was the largest in the ship.

The hatches of a smaller kind were distinguished by the name of Scuttles. See this article.

Hatch-bars were bars of wood or iron used to lay fore and aft over the hatches, being fitted with a padlock at one end, by which the hold might be secured from plunder.

HAWSE-HOLES; certain cylindrical holes cut through the bows of a ship on each side of the stem, through which the cables passed in order to be drawn into, or let out of the vessel, as occasion required. They are represented by *d d* in Plate 5, Fig. 4, being fortified on each side by the

Hawse-pieces, a name given to the foremost timbers of a ship, whose lower ends rested upon the knuckle timber, or the foremost of the cant-timbers. They were generally parallel to the stem, having their upper ends sometimes terminated by the lower part of the beak-head; and otherwise, particularly in small ships, by the top of the bow.

HEAD; an ornamental figure erected on the continuation of a ship's stem, as being expressive of her name, and emblematical of war, navigation, commerce, etc.

The heads which had any affinity to war or navigation, were, in general, either historical, as referring to some of the deities or heroes of antiquity ; or allegorical, as alluding to some of the natural consequences of battle, or the virtues most essential to a life exposed to perpetual danger. Thus, in the former sense, they represented a Neptune, an Alcides, a Mars, an Achilles, a Minerva, or a Jason ; and in the latter they produced a *Magnanime*, an Intrepid, a Revenge, or a Victory.

The head of a ship, however, had not always an immediate relation to her name, at least in the British Navy.

Plate 5, Figs. 2 and 3 represent heads of ships of the line.

In Fig. 2, P represents the gammoning-fish, which prevented the gammoning from wounding the bowsprit.

In Fig. 3, M is the main head-rail, which was a great support to the knee of the head.

N, the rail to which the berthing of the head was secured.

O, the lace-piece on the knee of the head.

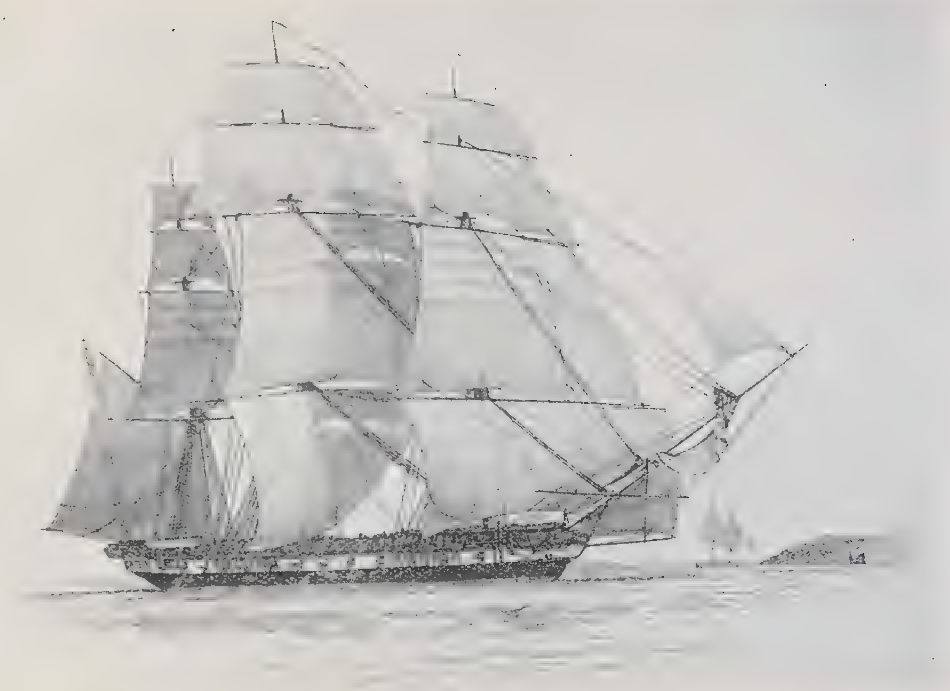
Head, was also used, in a more enlarged sense, to signify the whole front or fore part of a ship, including the bows on each side. Thus Plate 5, Fig. 4, represents one side of the fore part or head of a 74-gun ship, together with part of the bow, keel, and gunwale. The names of the several pieces shown therein were as follow :

A A, fore part of the keel, with *a a* the false keel beneath it.

C, the stem.

a, the cat-head.

b, the supporter of the cat-head.



E. W. Cooke, 1828.

A FRIGATE UNDER ALL SAIL.

c, the knight-head, or bollard timber, of which there was one on each side, to secure the inner end of the bowsprit.

d d the hawse-holes.

g g, the beak-head, which terminated the forecastle on the fore side, being called the beak-head bulk-head by shipwrights.

H H, the gun-ports of the lower deck.

h, the gun-ports of the upper deck and forecastle.

I, the channels, with their dead-eyes and chain-plates.

i, the gripe, or fore-foot, which united the keel with the stem, forming a part of either.

k k, these dotted lines represent the thickness and descent of the different decks from the fore part of the ship at the middle line. The lowest of the three dotted lines, *l*, expresses the convexity of the beams, or the difference between the height of the deck in the middle of its breadth, and at the ship's side. This is also exhibited more clearly in the midship-section (Plate 3, Fig. 1), where the real curve of the beam is delineated.

These lines were always parallel to the lines which terminated the gun-ports above and below.

m m, the timbers of the head.

X, the rails of the head which lay across the timbers.

Z, the main-wale.

z, the channel-wale.

W, the load water-line.

See also the continuation of a ship throughout her whole length, as referred to from the article Naval Architecture.

HEAD of a mast ; the upper part of any mast, or that whereon the cap or truck was fitted.

HEAD-LINES ; the ropes of all sails which were next to the yards, and by which the sails were made fast to the yards.

HEAD-RAILS ; the elliptic rails at the head of the ship.

HEART ; a peculiar sort of dead-eye, somewhat resembling the shape of a heart ; it was only furnished with one large hole in the middle (Plate 1, Fig. 16), whereas a common dead-eye had always three holes. It was principally used to the stays, as the dead-eyes were to the shrouds.

HEEL ; a name usually given to the after end of a ship's keel ; as also to the lower end of the stern-post, to which it was firmly connected.

Heel of a mast ; the lower end, which fitted into the step attached to the ship's keel.

Heel of a top-mast ; the lower end which was sustained by the fid upon the trestle-trees. See the article Mast.

HELM ; a long flat piece of timber, or an assemblage of pieces, suspended to the after part of a ship's stern-post by means of pintles and braces, which operated as hinges, and served to direct the course of a vessel. The helm was usually composed of three parts—viz., the rudder, the tiller, and the wheel—except in small vessels, where the wheel was unnecessary.

The length and breadth of the rudder are shown in Plate 5, Fig. 1, where it is evident that it became gradually broader in proportion to its distance from the top, or to its depth under the water. The back, or inner part of it, which joined the stern-post, was diminished into the form of a wedge throughout its whole length, so that it might be more easily turned from one side to the other, where it made an obtuse angle with the keel. The hinges by which it was supported are also shown in this figure. Those which were bolted round the stern-post to the after extremity of the ship, were called braces, or gudgeons, and were furnished with a large hole on the after part of the stern-post. The other parts of the hinges, which were bolted to the back of the rudder, were called pintles, being strong cylindrical pins, which entered into the braces, and rested upon them. The length and thickness of the rudder were nearly equal to that of the stern-post.

The tiller was a long bar of timber, fixed horizontally in the upper end of the rudder, within the vessel; the movements of the tiller to the right and left, accordingly directed the efforts of the rudder to the government of the ship's course, as she advanced. The operations of the tiller were guided and assisted by a sort of tackle, communicating with the ship's side, called the tiller-rope, which was usually composed of untarred rope-yarns, for the purpose of more readily passing through the blocks or pulleys.

In order to facilitate the management of the helm, the tiller-rope, in all large vessels, was wound about a wheel, which acted upon it with the powers of a windlass. The rope employed in this service being conveyed from the fore end of the tiller to a single block on each side of the ship, formed a communication with the wheel, by means of two blocks suspended near the mizzen-mast, and two holes immediately above, leading up to the wheel, which was fixed upon an axis, on the quarter-deck, almost perpendicularly over the fore-end of the tiller. Five turns of the tiller-rope were usually wound about the barrel of the wheel, and, when the helm was amidships, the middle turn was nailed to the top of the barrel, with a mark, by which the helmsman readily discovered the position of the helm, as the wheel turned it from one side to the other. The spokes of the wheel generally reached about eight inches beyond the rim or circumference, serving as handles to the person who steered the vessel.

HOISTERS, of the swifter. See the article Swifter.

HOLD ; the whole interior cavity or belly of the vessel, or all that part of her inside, which was comprehended between the floor and the lower deck, throughout her entire length.

HOLES in the sails ; were made with an instrument called a stabber, or pegging-awl, and were fenced round by stitching the edge to a small grommet ; such were the holes on the head of a sail for the rope-bands, or lacing of square sails, and for seizing on sails that bent on to hoops and hanks. Holes were also made across the sails in the reef-bands ; at the clews, for marling on the clew-rope ; and at the top brims of top-sails, for marling on the foot-rope.

HOODS, or Naval Whoods. See this article under the letter N.

HORSE ; a rope reaching from the middle of a yard to its arms, or extremities, and hanging about two or three feet under the yard, for the sailors to tread upon whilst they were loosing, reefing, or furling the sails, rigging out the studding-sail booms, etc. In order to keep the rope more parallel to the yard, it was usually suspended from it, at proper distances, by certain ropes called stirrups, which hung about two feet under the yard, having an iron thimble spliced into their lower ends through which the horse passed. See the article Rigging, Plate 8, Fig. 6, and Plate 15, Nos. 12, 22, 41, etc.

Horse was also a thick rope, extended in a perpendicular direction near the fore or after side of a mast, for the purpose of hoisting some yard, or extending the sail upon it: when fixed before the mast, it was used for the square sail, whose yard was attached to the horse, by means of a traveller, or bull's eye, which slid up and down occasionally: when placed abaft the mast, it was intended for the try-sail of a snow, but was seldom used in that position.

Iron-horse was the name given to a large round bar of iron, fixed in the head of ships, with stanchions and netting.

HOUNDS; a name given to those parts of a mast-head which gradually projected on the right and left sides, beyond the cylindrical or conical surface, which it preserved from the partners upwards. The hounds, whose upper parts were also called cheeks, were used as shoulders to support the frame of the top and trestle-trees, together with the top-mast and the rigging of the lower-mast. See the article Mast.

I

IN-HAULER; a rope employed to haul in the jib-boom.

INNER-POST; was a piece brought on at the fore side of the main-post, and generally continued as high as the wing-transom, to seat the transoms upon. The inner-post was a great security to the ends of the planks, and, as the main-post was seldom sufficient before the rabbet for that purpose, it likewise greatly strengthened the ship in that part; for if she should take the ground, especially by swinging, so as to break the stern-post, it was probable that much of the after deadwood would be carried away, because the joints were nearly in the same direction as the planks of the bottom. In Plate 7, Fig. 1, the inner-post is represented by D.

J

JAWS, sometimes called Horns; at the ends of gaffs or booms, were made semi-circular, for the purpose of confining them to the mast, which they effectually did by their forms, which embraced half the circumference of the mast.

JIB; the foremost sail of a ship, being a large stay-sail extended from the outer end of the bowsprit, prolonged by the jib-boom, towards the fore-top-mast-head. In cutters and sloops the jib was on the bowsprit, and extended on the lower-mast-head. See the article Sail.

Flying Jib, a sail sometimes set upon a boom, rigged out beyond the jib-boom, which article see.

Middle Jib, a similar sail, sometimes set before the two preceding, being extended from the end of the jib-boom, while the inner jib tack was nearly half way down, or on the boom.

JIB-BOOM; a continuation of the bowsprit forward, being run out from the extremity in a similar manner to a top-mast on a lower-mast, and serving to extend the boom of the jibs and the stay of the fore-top-gallant-mast. It was usually attached to the bowsprit by means of two large boom-irons, or by one boom-iron, and a cap on the outer end of the bowsprit; or by a cap without and a strong lashing within, instead of a boom iron, which was generally the method of securing it in small merchant ships. The jib-boom could be drawn in upon the bowsprit as occasion required, which was usually when a ship entered harbour, where it might very soon have been broken up or carried away by the vessels which were moored therein, or passing by under sail.

K

KEDGE, or Kedge Anchor; a small anchor used to keep a ship steady and clear from her bower anchor, while she rode in a harbour or river. See the article Anchor.

Kedges, or small anchors of ships, were made in proportion to their large anchors; their stocks were formerly of iron, but at the end of the 18th century were mostly of wood; they were two-thirds of the trend in diameter in the middle. Near the middle of the stock was a shoulder, that bore against the hole on one side of the square of the shank, with a forelock hole on the other side of the square of the shank, for a forelock to go through to confine the stock in its place. It was tapered from the middle each way, and when put through the shank, one end was bent, to prevent its falling out, and to keep it close, when brought to the side of the shank, for less stowage.

KEEL; the principal piece of timber in a ship, which was usually first laid on the blocks in building. It is represented by A in Plate 3, Fig. 1, and in Plate 7, Figs. 1, 4 and 5.

By comparing the carcase of a ship to the skeleton of the human body, the keel appeared as the backbone, and the timbers as the ribs. Accordingly the keel supported and united the whole fabric, since the stem and stern-post, which were elevated on its ends, were, in some measure, a continuation of the keel, and served to connect and enclose the extremities of the sides by transoms; as the keel formed and united the bottom by timbers.

The keel was generally composed of several thick pieces placed lengthways, which, after being scarphed together, were bolted and clinched upon the side.

False Keel, a strong thick piece of timber bolted to the bottom of the keel, which was also very useful in preserving the lower side. The false keel was provided for the purpose of preserving the under part of the main keel. In large ships of war, the false keel was composed of two pieces, called the upper and lower false keels. In Plate 3, Fig. 1, the false keel is represented by *a*.

KEELSON, or Kelson; a piece of timber, forming the interior, or counter-part of the keel, as it was laid upon the middle of the floor-timbers, immediately over the keel, and, like it, composed of several pieces scarphed together. The scarphs were, if possible, disposed clear of the main and fore-mast steps, and likewise the main-hatch. As every floor-timber was bolted through the keel, and every other through the kelson and keel together, it was necessary that the middle of the scarphs of the kelson be disposed over a floor-timber that was designed to be bolted through the kelson. In Plate 3, Fig. 1, the kelson is represented by B.

In order to fit with more security upon the floor-timbers and crotches, it was notched about an inch and a half deep, opposite to each of those pieces, and thereby scored down upon them to that depth, where it was secured by copper-bolts. The pieces of which it was formed were about two-thirds the breadth and thickness of those of the keel.

KEVELS, or Ranges ; a frame composed of two pieces of timber, whose lower end rested in a sort of step or foot, nailed to the ship's side, from where the upper ends branched outwards into arms or horns, serving to belay the tacks and sheets or great ropes by which the bottoms of the main-sail and fore-sail were extended. These are represented in Plate 6, Fig. 3.

KNEES ; crooked pieces of timber, having two branches or arms, and generally used to connect the beams of a ship to her sides or timbers. (See Plate 2, Fig. 5.)

The branches of the knees formed an angle of greater or smaller extent, according to the situation of the pieces they were designed to unite. One branch was securely bolted to one of the deck-beams, and the other was, in the same manner, strongly attached to a corresponding timber in the ship's side.

Besides the great utility of knees in connecting the beams and timbers into one compact frame, they contributed greatly to the strength and solidity of the ship, in the different parts of her frame to which they were bolted.

Knee of the head, or Cut-water, was a large flat piece of timber, fixed edgeways, upon the foremost part of a ship's stem, which supported the ornamental figure or image, placed upon the bowsprit. See the articles Head and Naval Architecture.

The knee of the head, which might properly be defined a continuation of the stem, as being prolonged from the stem forwards, was extremely broad at the upper part. It was fayed and bolted to the stem, let into the head, and secured to the ship's bows by strong knees fixed horizontally upon both, and called the cheeks of the head. The heel of it was scarphed to the upper end of the fore-foot, and it was fastened to the stem above by a lacing.

Besides supporting the figure of the head, this piece was otherwise useful, as serving to support the boom or bumkin, by which the fore-tack was extended to windward; and by its great breadth preventing the ship from falling to leeward, when closehauled, as much as she would otherwise do. It also afforded a greater security to the bowsprit, by increasing the angle of the bob-stay, so as to make it act more perpendicularly upon the bowsprit.

Iron Knees were frequently used in all the various applications instead of wooden ones, on account of the scarcity of timber fit for the purpose.

Iron-plate Knees were of iron, and, from their vertical situation under the deck, appeared to support the beams: they are represented by E E in Plate 2, Fig. 5, and by *l l*, in the Midship-section, Plate 3, Fig. 1.

Lodging-knees, were fixed horizontally in the ship's frame, having one arm bolted to the beam, and the other across two or three of the timbers, as represented by F F, Plate 2, Fig. 5.

Standard-knees were vertical curves employed generally with the orlop-beams; they were fastened on one side against the vertical side of the beam, and on the other against the ship's side; thus they differed from those which were simply called Standards, which article see.

Transom-knees were those which supported the highest transoms on the ship's quarter, and were bolted thereto, and to the after-timbers.

KNIGHT-HEADS, or Bollard-timbers; those timbers on each side of the ship nearest the stem, and continued high enough to secure the bowsprit. See Plate 5, Fig. 4, where the knight-head is represented by *c*.

KNOT; a large knob, formed on the extremity of a rope, generally by untwisting the ends thereof, regularly, amongst each other: there were many sorts of knots which differed in their form, size, and name, according to the various uses for which they were designed. As the methods of making these knots are described in any good seamanship book, or in small books specially devoted to the subject, it has not been considered necessary to describe them here.

KNUCKLE-TIMBERS; see the article Timbers.

L

LANYARDS; short pieces of rope or line, fastened to several machines in a ship, and serving to secure them in a particular place, or to manage them more conveniently; such were the lanyards of the gun-ports, the lanyard of the buoy, the lanyard of the cat-hook, the lanyards of the stoppers, etc.

The principal lanyards used in a ship, were those employed to extend the shrouds and stays of the masts, by their communication with the dead-eyes and hearts, so as to form a sort of mechanical power, resembling that of a tackle. See the articles Dead-eye and Heart.

These lanyards were fixed in the dead-eyes as follows: one end of the lanyard was thrust through one of the holes in the upper dead-eye, and then knotted, to prevent it from drawing out; the other end was then passed through one of the holes in the lower dead-eye, whence, returning upwards, it was inserted through the second hole in the upper dead-eye, and next through the second hole in the lower dead-eye, and finally through the third holes in both dead-eyes. The lanyard being well smeared with tallow it was hauled well taut by means of tackles. See Plate 3, Fig. 21.

LASKETS; small lines like hoops, sewn to the bonnets and drabblers of a ship, to lash or lace the bonnets to the courses, or the drabblers to the bonnets.

LATCHINGS; loops formed on the line that was sewn to the head of a bonnet to connect it with the foot of a sail; these loops were six inches apart, except the two middle ones, which were twelve inches long, to fasten off with. The loops were alternately rove through holes in the foot of the sail, and through each other, and fastened by the two long loops in the middle with two half hitches, by the loosing of which they unrove themselves.

LEDGES ; small pieces of timber placed athwartships, under the decks of a ship, in the intervals between the beams, as exhibited by H, in the representation of the deck, Plate 4.

LIFE-BOAT ; an invention of the utmost consequence to the lives and safety of seafaring persons.

The construction of a boat for the preservation of lives from ships driven on the shores of this kingdom, was originally suggested by the subscribers to the News Room at the Law House, South Shields, in 1789 ; who, from situation, were the more immediate spectators of the destruction inevitably attending vessels and their crews coming on the sand at the south entrance of Tynemouth haven.

In September, 1789, the ship *Adventure*, of Newcastle, was stranded on the Herd sands, on the south side of Tynemouth haven, in the midst of the most tremendous breakers ; and all the crew dropped from the rigging, one by one, in the presence of thousands of spectators ; not one of whom could be prevailed on by any reward to venture out to her assistance in any boat of the common construction. On this melancholy occasion the gentlemen of South Shields called a meeting of the inhabitants, and premiums were instantly offered for plans of a boat which should be the best calculated to brave the dangers of the sea, particularly of broken water. Many proposals were accordingly offered ; but the preference was given unanimously to a Mr. Greathead's, who was immediately directed to build a boat at the expense of the committee.

The boat went off on the 30th January, 1790 ; and so well did it answer, and even exceed, every expectation, in the most tremendous sea, that during the ensuing 21 years, no less than 300 lives were saved at the entrance to the Tyne alone.

The particular construction of this boat will be best understood by referring to Plate 6, where Fig. 2 represents a cross section of the life-boat.

FF, the outside coatings of cork.

GG, the inside cork filling.

H H, the outside planks of the boat.

I, one of the stems of the boat.

K, the keel.

N N, the timber-heads.

P, the thwarts, or rowers' seats.

R, one of the stanchions under the thwarts, each being thus firmly supported.

S, a section of the gang-board, which crossed the thwarts, and formed the passage from one end of the boat to the other.

T, the floor-heads, or platform for the rowers' feet.

U U, the two bilge pieces, nearly level with the keel.

W W, the gunwales.

X, a ring-bolt for the head-fast, there being another also at the other end.

Y, platform for the steersman.

Fig. 8, A Longitudinal Section of the Life-boat.

EEE, the sheer or curve of the boat.

I I, the two stems or ends.

K, the keel.

L L, the aprons to strengthen the stems.

M M, the sheets, or place for passengers.

N N, the timber-heads or boat-fastenings.

O O O O, the tholes, on which the oars where slung by grommets.

T, the flooring under the rowers' feet.

LIFTS; certain ropes descending from the cap and mast-head, to the extremities of the yards immediately under; where, passing through a block or pulley, they became double. They were used to keep the yard square, or to pull one of its extremities higher than the other, if occasion required; but particularly to support the weight of it, when a number of seamen were employed on it to furl or reef the sail.

LINES; the general appellation of a number of small ropes in a ship, formed of two or more fine strands of hemp; as

Cod-line, a small line of 18 threads, used on the banks of Newfoundland. The thread was spun 100 yards, having 6 threads to a strand, 3 strands to the line, and standing 40 fathoms, which weighed 3 lbs. There were also cod-lines of smaller sizes, with 15, 12, and 9 threads.

Navel-line, a small rope that passed from the tops to the trusses, to keep them up in their place when overhauled, for the purpose of bracing the lower-yards sharp up for sailing by the wind, etc.

The description and uses of the other lines are arranged under their proper heads.

LIZARD; an iron thimble, spliced into the main-bowlines, and pointed over, to hook a tackle to.

LOCKER; a kind of box or chest, made along the side of a ship, for the purpose of stowing anything in.

LONG-TIMBERS; those timbers in the cant-bodies, which reached from the dead-wood to the head of the second futtock.

LUGGER ; a small vessel carrying either two or three masts, with a running bowsprit, upon which she set lug-sails, and sometimes had top-sails adapted to them.

On the bowsprit were set two or three jibs ; and the lug-sails hung obliquely to the masts, their yards being slung at one-third their length, one on each lower-mast and top-mast : the top-mast fixed abaft the mast-head as those of schooners. Luggers sailed well closehauled, and very near the wind.

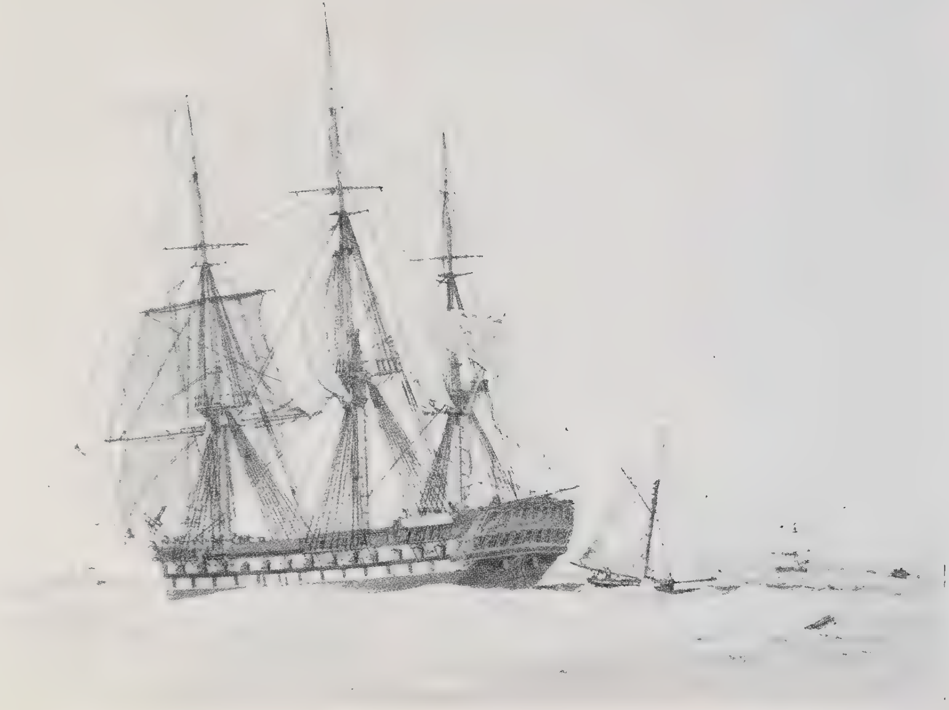
The rigging was very light and simple : the masts were supported by shrouds and stays ; and the yards had halyards, lifts, and braces. To the lee-clew of the sail was a sheet, and to the windward-clew a tack, which was occasionally shifted as the vessel went about.

Some luggers were merely open boats, and had only a small mast and a ring-sail set to it over the stern, and the foot spread by a small boom. The French employed luggers as privateers, but there were not many vessels of this description in our service. For a representation of a lugger, see Plate 16, Fig. 2.

M

MAGAZINE ; a close room or storehouse, built in the forward or after part of a ship's hold, to contain the gunpowder.

MAIN ; a name applied to whatever was principal, as opposed to what was inferior or secondary. Thus the main-mast, main-wale, main-keel, and main-hatchway, were distinguished from the fore and



E. W. Cooke, 1828.

THE "THAMES." EAST INDIAMAN. 1,424 TONS.

Built for, and employed by the Honourable East India Company.

mizzen-masts, the channel-wales, the false-keel, and the fore and after-hatchways, etc.

For the sails, yards, and rigging of the main-mast, see those particular articles.

Main-breadth, was the broadest part of a ship at any particular frame.

Main-post, the same as Stern-post.

Main-sheet Block; see the article Block.

MANGER; a small apartment, extending athwart the lower-deck of a ship of war, immediately within the hawse-holes, and fenced at the after part by the

Manger-board, a strong bulk-head, fixed on the fore part of the deck, and serving to stop the water which sometimes rushed in at the hawse-holes, and would otherwise run aft in great streams on the deck. See the letter M in the representation of the deck, Plate 4.

MAN-ROPES; a general name given to the small set of ropes which were used for ascending or descending a ship's side, hatch-ways, etc. They were usually covered with kersey or canvas.

MARTINGALE; a name given to the rope extending downwards from the jib-room end to a kind of bumkin, and generally fixed perpendicularly under the cap of the bowsprit; its use was to confine the jib-boom down in the same manner as the bob-stay retained the bowsprit.

MARTNETS; small lines fastened to the leech of a sail, being rove through a block at the topmast-head, and coming down by the mast to the deck.

Their use was to bring the leech of a sail close down to the yard to be furled.

MAST ; a long round piece of timber, generally elevated upon the keel of a ship ; to which were attached the yards, sails, and rigging.

A mast, with regard to its length, was either formed of one single piece, which was called a pole-mast, or composed of several pieces joined together, each of which retained the name of mast separately. The lowest of these was called accordingly the lower-mast, *a*, in Fig. 1, Plate 6. The next in height was the top-mast *b*, which was erected at the head of the former ; and the highest was the top-gallant-mast, *c*, which was prolonged from the upper end of the top-mast. These masts are also represented in Figs. 5, 6 and 7 respectively.

Lower-mast, was the lowest mast in a ship ; the foot or heel of it rested in a block of timber called the step, which was fixed upon the kelson (See Plate 6, Fig. 9.)

Top-mast, *b*, was that which was raised at the head or top of the lower-mast through a cap, and supported by the trestle-trees. It was composed of two strong bars of timber, supported by two prominences, which were as shoulders on the opposite sides of the mast, a little under its upper end : athwart these bars were fixed the cross-trees, upon which the frame of the top was supported. Between the lower-mast head, and the foremost of the cross-trees, a square space remained vacant, the sides of which were bounded by the trestle-trees. Perpendicularly above this was the foremost hole in the cap, whose after hole was solidly fixed on the head of the lower-mast.

Top-gallant Mast, *c*, a smaller mast than the preceding, and raised and secured to the head of the top-mast in the same manner as the latter was to the lower-mast.

Top-gallant Royal Mast, was a yet smaller mast, sometimes elevated through irons at the head of the top-gallant mast ; but it was more often a continuation of the latter above the rigging, when it was termed a pole top-gallant mast, to distinguish it from a stump top-gallant mast, which terminated just above the rigging.

Main-mast, was the largest mast in a ship, standing nearly midships between the stem and stern.

Fore-mast, was that which was erected near the stem of a ship, and was next in size to the main-mast.

Mizzen-mast, was the smallest mast, which stood about half way between the main-mast and the stern. See the article Mizzen-mast.

The positions of the fore, main, and mizzen-masts are represented by W, X and Y respectively in the plan of the deck, Plate 4.

Mast-carlings were large carlings at the side of the mast-rooms that were left deep enough to receive the cross-chocks.

Mast-coats were coverings made of well-tarred canvas, to prevent the water from going down the mast-hole.

The following rules were given, as being the result of long practice and experience, for the situation of the masts in the King's service, but it is probable that there existed more whim or fancy in these regulations than real truth. The centre of the fore-mast to be abaft the after side of the rabbet of the stem, or inside the plank of the lower-deck, being one-ninth part of the length of the lower-deck: the centre of the main-mast to be abaft the after side of the rabbet of the stem, also on the lower deck, taking five-ninths of its length: and the centre of the mizzen-mast to be abaft the after side of the stem on the lower-deck, at seventeen-twentieths of its length.

Proportions for the Lengths and Diameters of the Masts in the Royal Navy (1815).

Lengths of Masts.—The length of the lower-deck and extreme breadth being added together, the half was the length of the main-mast; thus the length of the lower-deck of a 74-gunship was 176 feet; extreme breadth, 48 ft. 8 ins.; added together they make 224 ft. 8 ins. The half, or 112 ft. 4 ins. was the length of the main-mast; which being determined, the other masts bore the following proportions:

Fore-Mast, eight-ninths of the main-mast.

Mizzen-mast, 100 guns, seven-eighths; 90 to 50 guns, six-sevenths; 44 to 20 guns, five-sixths of the main-mast.

In sloops, the mizzen-mast was three-fourths of the main-mast.

When the mizzen-mast stepped on the Lower-deck, the depth of the hold was to be deducted from the length here given.

Main-topmast, three-fifths of the main-mast.

Fore-topmast, eight-ninths of the main-topmast.

Mizzen-topmast, three-fourths of the main-topmast.

In sloops, the mizzen-topmast was five-sevenths of the main-topmast.

Top-gallant Masts, one half the length of the top-mast.

Bowsprits, of 80-gun ships and upwards, seven-elevenths of their main-masts. Bowsprits of 74-gun ships and under, three-fifths of their main-masts.

Brig's Main-masts. The depth in the hold was added to the length and breadth, and one half was the length of the main-mast.

Cutter's Main-masts. Add together the length of the deck, the breadth extreme, and depth of the hold; and three-quarters of that sum was the length of the main-mast.

Diameters of Masts.—Main and Fore-masts of ships of 100 to 50 guns inclusive, were one inch in diameter at the partners to every yard in length. Ships of 44 to 32 guns inclusive, nine-tenths of an inch to every yard in length. Ships of 28 guns and under, seven-eighths of an inch to every yard in the length.

Main-masts of Brigs, one inch to every yard in length; and the fore-mast nine-tenths of the diameter of the main-mast.

Masts of Cutters, three-fourths of an inch in diameter to every yard in length.

Mizzen-masts of Ships of 100 to 64 guns inclusive, three-fifths of the diameter of the main-mast.; 50-gun ships and under, two-thirds of the diameter of the main-mast.

Main and Fore-topmasts, one inch to every yard in the length of the fore-topmast.

Mizzen-topmast, seven-eighths of the diameter of the maintopmast.

Top-gallant Masts, one inch to every yard in their lengths.

Royal-masts, two-thirds of the diameter of their topgallant-masts.

Bowsprits of Ships of 100 to 64 guns inclusive, two inches less than the diameter of the main-mast. In 50-gun ships and under, the same diameter as the main-mast.

Proportions for the Lengths and Diameters of Booms.

(See the article Yard.)

Lengths of Booms.—Lower-studding sail-booms, five-ninths of the main-yard.

Top-studding sail-booms, one half the length of the yards they go on.

Flying-jib-boom, five-sevenths of the bowsprit.

Driver-boom, the same length as the main-topsail-yard.

Diameters of Booms.—Studding-sail-Booms, one inch to every five feet in the length.

Flying Jib-booms, seven-eighths of an inch to every yard in length .

Driver-boom, the same as the fore-topsail-yard.

Table of the Dimensions of Masts in Use in the Royal Navy (1815).

	110 Guns. 2,164 Tons.			90 Guns. 1,870 Tons.			80 Guns. 1,620 Tons.			74 Guns. 1,800 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-mast	117	0	39	112	0	37¼	107	0	35⅝	111	0	37
Main-topmast ..	70	0	20¾	66	0	19¾	64	0	19¼	66	0	19¾
Main-topgallant-mast	35	0	11⅝	33	0	11	32	0	10¼	33	0	11¼
Fore-mast	103	6	34½	100	0	33½	95	9	31⅞	98	6	32¾
Fore-topmast ..	62	10	20¾	59	0	19¾	59	9	19¼	58	8	19¾
Fore-topgallant-mast	31	0	10¾	29	0	9⅝	28	6	9½	29	4	9¾
Mizzen-mast ..	101	4	23	96	6	22¼	93	0	21⅛	95	0	22¼
Mizzen-topmast ..	52	0	14	49	0	13½	46	0	13¼	49	0	13½
Mizzen-topgallant-mast	26	0	8⅝	24	0	8	23	0	7⅝	24	6	8⅛
Bowsprit	74	0	37	71	0	35½	68	0	34	67	6	35

	64 Guns. 1,369 Tons.			50 Guns. 1,044 Tons.			44 Guns. 879 Tons.			38 Guns. 951 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-mast	101	0	33½	92	0	29	88	0	26¼	90	0	27
Main-topmast ..	58	6	17⅝	53	0	16	53	0	15¾	54	0	16⅛
Main-topgallant-mast	29	3	9¾	26	6	8⅞	26	6	8¾	27	0	9
Fore-mast	89	7	29¾	81	6	26⅜	78	0	23⅝	80	0	23⅝
Fore-topmast ..	53	0	17⅝	48	0	16	47	0	15¾	48	0	16⅛
Fore-topgallant-mast	26	6	8¾	24	0	8	23	6	7¾	24	0	8
Mizzen-mast ..	86	0	19¾	78	9	19⅜	74	6	17⅞	75	7	18⅛
Mizzen-topmast ..	43	6	12¼	40	0	11⅛	40	0	11	41	0	11¼
Mizzen-topgallant-mast	21	9	7¼	20	0	6⅝	20	0	6⅝	20	6	6¾
Bowsprit	60	4	31½	56	0	29	52	6	26¼	55	0	27

	36 Guns. 874 Tons.			32 Guns. 677 Tons.			28 Guns. 594 Tons.			24 Guns. 513 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-mast	89	0	26	85	0	24¾	81	4	23⅝	75	0	22¼
Main-Topmast ..	53	4	15¾	51	0	15⅛	48	9	14⅜	45	0	13¼
Main-topgallant-mast	25	8	8⅝	25	6	8½	24	4	8	22	6	7½
Fore-mast	79	6	23⅜	75	0	22	72	0	20⅞	66	6	19½
Fore-topmast ..	47	0	15¾	45	0	15⅛	43	0	14⅜	40	0	13¼
Fore-topgallant-mast	22	5	7½	22	6	7½	21	6	7	20	0	6½
Mizzen-mast ..	74	8	17¾	72	0	17	69	0	16¾	64	0	15
Mizzen-topmast ..	40	0	11⅛	38	0	10⅝	36	7	10	33	9	9¼
Mizzen-topgallant-mast	20	0	6½	19	0	6¼	18	3	6	16	10	5½
Bowsprit	54	0	26	52	0	25	48	9	23⅝	45	0	22¼

	20 Guns. 429 Tons			Sloops of 300 Tons.			Brigs of 200 Tons.			Cutters of 200 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-mast	72	0	21⅝	63	0	18⅜	56	0	19	88	0	22
Main-Topmast ..	43	2	12¾	37	6	11¼	31	0	10	—	—	—
Main-topgallant-mast	21	7	7¼	18	9	6¼	23	6	6¼	44	0	9¾
Fore-mast	64	0	19	56	0	16⅜	49	0	17	—	—	—
Fore-topmast ..	38	4	12¾	33	4	14¼	31	0	10	—	—	—
Fore-topgallant-mast	19	2	6⅜	16	8	5⅝	23	6	6¼	—	—	—
Mizzen-mast ..	61	0	14	48	0	12	—	—	—	—	—	—
Mizzen-topmast ..	32	5	9	26	9	7¾	—	—	—	—	—	—
Mizzen-topgallant-mast	16	0	5¼	13	0	4¼	—	—	—	—	—	—
Bowsprit	43	6	21⅝	37	6	18⅜	34	0	17	64	0	20

The diameters in the foregoing tables of dimensions, were taken at the partners of lower-masts (which were at the middle-deck in three-decked ships, and at the upper-deck in all other ships); at the cap in topmasts, topgallant, and royal masts; and at the bed of bowsprits.

N.B.—Masts with hoops were made one inch larger than the diameter given in these tables, two feet each way from the partners, to give the hoops a quicker drift.

In order to secure the masts, and counteract the strain they received from the effort of the sails impressed by the wind, and the labouring of the ship at sea, they were sustained by several strong ropes, extended from their upper ends to the outside of the vessel, called shrouds, as represented in Fig. 1, Plate 6. They were further supported by other ropes, stretched from their heads towards the fore part of the vessel. See the article Rigging.

MIDSHIP-BEAM ; the beam upon which the extreme breadth of the ship was formed, and which was situated in the midship-frame, nearly in the middle of her length, serving as a standard from which the dimensions and proportions of her masts and yards were taken.

Midship-bend, was the broadest frame in a ship, called dead-flat.

Midship-section, or midship-frame, was a name given to that piece of timber, or combination of pieces, formed into one frame, which determined the extreme breadth of a ship, as well as the figure and dimensions of all the inferior timbers. See the article Naval Architecture.

Explanation of the Midship-section, Plate 3, Fig. 1, which shows the transverse section of a 74-gun ship, at the broadest part, answering to the same scale by which are delineated the head, quarter, and stern of a ship, of the same size, in Plate 5, etc., to which the reader is referred.

A, the keel, with *a*, the false keel, beneath it.

B, the kelson.

C, one of the beams of the orlop.

D, one of the lower-deck beams ; with *b*, the beam of the upper-deck.

E, the hanging-knees, by which the beams were attached to the timbers.

F, a common standard.

G, the clamps, which sustained the extremities of the beams.

H, the gun-ports of the lower-deck; with *c*, the ports of the upper-deck.

I K, the different pieces of thick-stuff, placed opposite to the several scarphs, or joinings, in the frame of timbers.

L, the rising or dead-wood.

M, the planks of the decks.

N, the water-ways.

O, the planks of the ceiling, between the several ranges of thick-stuff.

P, the spirkettings.

Q, the main-wale, to fortify the ship's side opposite to the lower-deck.

R, the channel-wale, opposite to the upper-deck.

S, the sheer-strake.

T, the string.

V, the floor-timbers, which were laid across the keel and bolted to it.

U, the angle-chocks, at the head of the floor-timber, and heel of the second futtock.

W, the angle-chocks, at the head of the first futtock, and heel of the third futtock.

X, the angle-chocks, at the head of the second futtock and heel of the fourth futtock.

Y, the angle-chocks, at the head of the third futtock and heel of the top-timber.

Z, a cross-chock, at the heels of the first futtocks.

d, the coamings to the hatchways on the different decks.

e, the floor-rider.

g, the shell-pieces under the beam.

h, the chock under the shelf.

i, the fillings between the futtock-riders, for faying the ship to.

k k, the chocks under the beams, in lieu of wooden knees.

l l, the plate-knees, with ears, which secured the beams to the ship's side.

MIZZEN ; the aftmost or hindmost of the fixed sails of a ship, extended sometimes by a gaff, and sometimes by a yard, which crossed the mast obliquely ; the fore end reaching almost down to the deck, and the after end being peaked up as high above the middle of the yard, which was attached to the mast ; the head and fore leech of the mizzen were laced upon the gaff (or yard) and mast ; and the sheet hauled out near the taffrail.

Mizzen-mast ; the mast which supported all the after sails. The explanations of this mast being, in general, applicable also to the same fittings of both the other masts, the reader is referred to that article, and also to those under the headings, Shroud, Stay Yard, etc.

MORTAR ; a short piece of ordnance, thick and wide, having a chamber less than the size of its bore, and used to discharge bombs or carcasses into a fortified place.

MUNIONS ; the pieces that parted the lights in the stern and quarter-gallery.

MUZZLE, of a gun ; the extreme end round the mouth ; hence muzzle-ring was that ring which strengthened the mouth or muzzle. See the articles Cannon and Gun.

N

NAVAL ARCHITECTURE; or the science of shipbuilding, comprehends the theory of delineating marine vessels upon a plane; and the art of framing them upon the stocks, according to the proportions exhibited in a regular design. It is of the utmost importance that the mechanical skill of the shipwright should be assisted by plans and sections, which have been drawn with all possible accuracy, examined by proper calculations, and submitted to the most careful scrutiny.

It is not within the limits of this volume to enter into a history of naval architecture; we shall merely refer the reader to the different articles relating to it in this work, which show the methods employed at the end of the 18th century, and particularly to the following article.

"Naval architecture, or shipbuilding, may be divided into three parts.

"*First.*—To give the ship such an exterior form as may be most suitable for the service for which she is designed.

"*Second.*—To give the various pieces of a ship their proper figures, and unite them into a firm and compact frame, so that by their dispostiion they may form a solid fabric.

"*Third.*—To provide convenient accommodation for the officers and crew, and also suitable places of stowage for the cargo, furniture, provisions, artillery, ammunition, etc.

"A general idea of the use, figure, and station of the principal pieces, to those who are entirely unacquainted with the subject, may be gathered from the following definitions, which are illustrated by suitable figures.

" *First.*—The whole length of the ship is represented according to a side view, perpendicular to the keel, and is termed the plane of elevation, or sheer-draught. (Plate 7, Fig. 2.)

" *Second.*—The ship is exhibited according to an end view, and stripped of her end planks, so as to present the outlines of the principal timbers ; and this is termed the plane of projection, or the vertical plane of the timbers, because it shows the projection of their frames relatively to each other (Plate 7, Figs. 4 and 5)

" *Third.*—It is not sufficient to have the vertical curves of the bottom in different places, for a distinct idea of the horizontal curves is also equally necessary and useful : this is obtained by means of water-lines traced upon what is called the horizontal plane (Plate 7, Fig. 3)

" The elevation or sheer-draught determines the length and depth of the keel ; the length and projection, or rake of the stem and stern-post ; the position of the midship-frame upon the keel, together with that of the principal frames afore and abaft ; the wales, the dimensions and situations of the gun-ports, the projection of the rails of the head and quarter gallery, with the stations of the masts and channels.

" This draught, however, conveys no idea of the vertical curve of the ribs or timbers ; for as their projection will be only represented in a plane elevated upon the length of the keel, they will appear in this direction as straight lines. To perceive these curves accurately, they must be regarded from another point of view, which will represent their projection upon a vertical plane, supposed to cut the keel at right angles in the place where the ship is broadest. For, as all ships are broader near the middle of their length than at the extremities, it is evident that the timbers are more extended in proportion. The most capacious of these represents what is called the midship-section ; and upon the area of this section is delineated the projection of all the others.

"Thus the plane of projection limits the different breadths of a ship in various points of her length, and exhibits the outline of her timbers respectively to each other, as they are erected upon the keel. Accordingly this draught ought to represent a variety of sections of the ship in different places of her length, and always perpendicular to the upper edge of the rabbet of the keel, so that the eye of the observer, when placed in what may be properly termed the axis of the ship, may perceive the several sections at one glance ; that is to say, when looking full on the stem, from before the ship, discover the fore timbers ; and, when looking from behind, directly on the stern, he shall perceive the form of the after timbers.

"To form a just idea of this plane, therefore, we ought to suppose a ship resting upon the stocks in the same position as when afloat upon the water. Thus a variety of black vertical lines may be drawn at equal distances upon the bottom, which is white, to form the different outlines of the ship corresponding to the timbers within. It is to be observed, that the fashion of the inferior timbers must conform to the figure of the midship-section, which is placed in the fullest part of the ship ; and as the planes of all the other timbers diminish in a certain progression as they approach the stem and stern, they are properly delineated on the plane of the midship-section, which also represents the depth of the keel and length of the midship-beam.

" As the two sides of a ship ought to be exactly alike, it is judged sufficient to represent the sections of the fore part of the ship on the right side, and those in the after part on the left, so as to perceive all the sections, as well afore as abaft, upon one plane.

See Projection, Plate 7.

" However necessary it may be to understand precisely the vertical curves of the bottom, it is no less requisite to have a just idea of those which are horizontal.

" The horizontal, or floor plane, is that upon which the whole frame is erected, and will be more clearly understood by previously describing the water-lines and ribands of which it is composed.

" When a ship floats upon the stream, it is evident that her upperworks will appear to be separated from the bottom by the surface of the water, which will accordingly describe an imaginary horizontal line upon the bottom from the stem to the stern-post.

" The most elevated of those lines is termed the upper horizontal or water-line ; and, in order to prove the fairness of the body, the several horizontal lines are set up at equal distances above the base-line, and distinguished by the water-lines N I J K L, in the Projection. This we would always recommend to be done, although the water-lines of many ships are not parallel with the line of the keel ; for, unless they are parallel with the keel, they cannot answer the intended purpose of laying off the ship.

" By lightening a ship gradually, and at the same time preserving the direction of her keel, or the angle which it makes with the surface of the water, a variety of water-lines may be drawn parallel to each other. See a further illustration of these lines in the article Water-line.

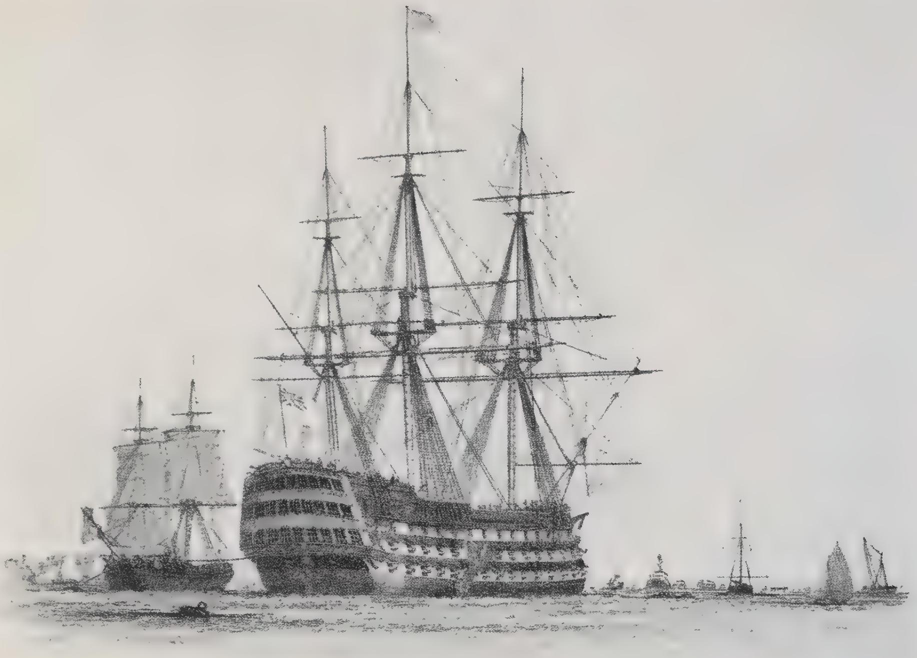
" The ribands are likewise of great utility in ship-building; they are narrow and flexible planks placed on the bottom at different heights, so as to form a sort of mould for stationing the inferior timbers between the principal ones. They differ from the water-lines, inasmuch as the latter have only one curve, which is horizontal, whereas the ribands, besides the horizontal one, have vertical curves from the main-breadth upwards. See the article Ribands.

" We have already observed, that the qualities required in a ship ought to determine the figure of the bottom: a ship of war, therefore, should be able to sail swiftly, and carry her lower tier of guns sufficiently out of the water. A merchant ship ought to contain a large cargo of mercantile goods, and be navigated with few hands; and both should be able to carry sail firmly, steer well, drive little to leeward, and sustain the shocks of the sea without being violently strained.

" The first thing to be established in the draught of a ship is her length; and, as a ship of war, according to her rate, is furnished with a certain number of cannon, which are placed in battery on her decks, it is necessary that a sufficient distance should be left between the ports to work the guns with facility, and particularly to leave space enough between the foremost gun and the stem, and between the aftmost gun and the stern-post on each side, on account of the arching or inward curve of the ship towards her extremities.

" When the length of a ship is determined, it is usual to fix her breadth by the dimensions of the midship-beam. On this occasion the shipwrights, for the most part, are conducted by rules founded on their own observation ; for, having remarked, that some vessels, which by repeated experience have been found to answer all the purposes of navigation, have a certain breadth in proportion to their length, they have inferred that it would be improper to depart from this proportion : but, as other ships have been constructed with different breadths, which were equally perfect, a variety of different general rules have been adopted by these artists, who are accordingly divided in their opinions about the breadth which ought to be assigned to a ship relatively with her length, whilst each one produces reasons and experience in support of his own standard. Those who would diminish the breadth allege : first, that a narrow vessel meets with less resistance in passing through the water ; second, that by increasing her length she will drive less to leeward ; third, that, according to this principle, the water-lines will be more conveniently formed to divide the fluid ; fourth, that a long and narrow ship will require less sail to advance swiftly ; that her masts will be lower, and her rigging lighter ; and, in consequence, the seamen less fatigued with managing the sails, etc.

" Those, on the contrary, who would enlarge the breadth, pretend : first, that this form is better fitted to receive a good battery of guns ; second, that there



E. W. Cooke, 1828.

THE "VICTORY." FIRST RATE. 104 GUNS.

In Portsmouth Harbour, 1828.

will be more room to work the guns conveniently; third, that by carrying more sail, the ship will be enabled to run faster; or, that this quality will at least overbalance the advantage which the others have of more easily dividing the water; fourth, that, being broader at the load water-line, or place where the surface of the water describes a line round the bottom, they will admit of being very narrow on the floor, particularly towards the extremities; and, fifth, that a broad vessel will more readily rise upon the waves than a narrow one.

"From such opposite principles has resulted that variety of standards adopted by different shipwrights; and a servile imitation of these mechanical methods has, to the great reproach of the art, produced all these pretended rules of proportion: for the various models they have hitherto adopted indisputably prove their doubt and uncertainty with regard to their proper standard. Hence the pretended mysteries which are only to be revealed to such as are initiated into the craft! And hence violence of opposition, and mutual contempt among the artists! Indeed, nothing appears more effectually to have retarded the progress of naval architecture, than the involving it in mysteries which the professors would gravely insinuate are only intelligible to themselves. This ridiculous affectation is, nevertheless, too generally retained, notwithstanding the example to the contrary of some of the most able shipwrights in Europe, who are real masters of the theory of their art, and do honour to their profession, and who are justly exempted from the censure to which the others are often exposed.

"It is not to be expected that an art so complicated and various, comprehending such a diversity of structures, can be treated at large in a work of this sort. To enter into a particular detail of the theory and practice, to explain the different parts with sufficient accuracy and perspicuity, would of itself require a large volume, and, consequently, much exceed the limits of our design. See the article Shipbuilding.

" Being thus necessitated to contract our description into a narrow compass, it will be sufficient to give a general idea of the subject, to describe the principal pieces of which a ship is composed, and to explain the principal draughts used in the construction thereof.

" As the several lines exhibited in the planes of elevation, projection, etc., will be rendered more intelligible by a previous account of the principal of those pieces, it may be proper to begin with reciting their names, and giving a summary description of their uses and stations. They are, for the most part, represented according to the order of their disposition, in Plate 7, Fig. 1, and termed Pieces of the Hull.

" A, the pieces which compose the keel, and which are securely bolted together, and clinched.

" B, the stern-post, which is tenoned into the keel, and which unites the sides of the ship abaft.

" C, the stem, which is composed of three pieces scarphed together, into which the ship's sides are united forwards.

" D, the inner-post, into which the transoms are let.

" E, the false post, which serves to augment the breadth of the stern-post.

" F, the pieces of dead-wood, which form the after part of the ship.

" G, the knee of the stern-post, which unites it to the keel.

" H, the apron which is fayed on the inside of the stem, to support the scarph thereof ; for which reason, the scarph of the former must be at some distance from that of the latter.

" I, the stemson, which reinforces the scarph of the apron.

" K, the wing-transom which is fayed across the stern-post, and bolted to the head of it, having its two ends let into the fashion-pieces.

" L, the deck-transom, parallel to the wing-transom, which is secured in the same manner.

" M, the filling-transom.

" N, the lower-transoms.

" O, the foremost fashion-piece on one side ; the heel of which is connected with the dead-wood, and the head is secured to the wing-transom.

" P, the middle fashion-piece.

" Q, the after fashion-piece.

" R, the side counter-timber, which steps on the end of the wing-transom.

" S, the sternson.

" T, the gripe.

" U, the lengthening piece on the side counter-timber.

" V, the scarph of the after-piece of the keel.

" W, the pieces which compose the kelson, and which are scarphed together and placed over the middle of the floor-timbers, upon each of which they are scored about an inch.

" Y, the several pieces of the knee of the head ; the lower part of which is fayed to the stem ; the heel being scarphed to the gripe.

"In vessels of war, the general dimensions are established by authority of officers appointed by the government to superintend the building of ships. In the merchant-service the extreme breadth, length of the keel, depth of the hold, height between decks and in the waist, are agreed on by contract; and from these dimensions the shipwright is to form a draught suitable to the trade for which the ship is designed.

"In projecting the draught of a vessel of war, the first article to be considered is her length. As every ship is much longer above than below, it is also necessary to distinguish the precise part of her height, from which her length is taken: this is usually the lower gun-deck, or the load water-line. It has been already observed, that water-lines are described longitudinally on a ship's bottom by the surface of the water in which she floats, and that the line which determines her depth under the water is usually termed the load water-line. In this draught it will be particularly necessary to leave sufficient distance between the ports.

"The next object is to establish the breadth by the midship-beam. Although there is a great difference of opinion about proportioning the breadth to the length, yet it is most usual to conform to the dimensions of ships of the same rate. After the dimensions of the breadth and length are determined, the depth of the hold must be fixed, which is generally half the breadth: but the form of the body should be considered on this occasion; for a flat floor will require less depth in the hold than a sharp one. The distance between the decks must also be settled.

"We may then proceed to fix the length of the keel, by which we shall be enabled to judge the rake of the stem and stern-post. The rake is known to be the projection of the ship at the height of the stem and stern-post, beyond the ends of the keel afore and abaft ; or the angle by which the length is increased as the fabric rises. To these we may also add the height of the stem and wing-transom.

" As a ship is much broader at the middle than at the extremities, the arms of the floor-timber will form a very obtuse angle at the extreme breadth ; but this angle decreases in proportion to the distance of the timbers from the midship-section, so that the foremost and aftmost ones will form a very acute angle.

" Shipwrights differ extremely in determining the station of the midship-section ; some placing it at the middle of the ship's length, and others farther forward. They who place it before the middle, allege, that if a ship is full forward, she will meet with no resistance after she has opened a column of water ; and that the water so displaced will easily unite abaft, and by that means force the ship forward ; besides having more power on the rudder, in proportion to its distance from the centre of gravity ; this also comes nearer the form of fishes, which should seem the most advantageous for dividing the fluid.

" When the rising of the midship-floor-timber is decided, we may then proceed to describe the rising-line of the floor, on the stern-post abaft, and on the stem afore.

" The height of the lower-deck is the next thing to be considered. It is determined in the middle by the depth of the hold ; and some builders make it no higher than the stem ; but they raise it abaft as much above its height in the middle as the load-water-mark, or draught of water abaft, exceeds that afore. With regard to the height between decks, it is altogether arbitrary, and must be determined by the rate of the ship, and the service she is designed for.

" It is also necessary to remember the sheer of the wales, and to give them a proper hanging ; because the beauty and stateliness of a ship greatly depend upon their figure and curve, which, if properly drawn, will make her appear airy and graceful upon the water.

" We come now to consider the upper-works, and all that is above water, called the dead-work : and here the ship must be narrower, so that all the weight lying above the load water-line may thereby be brought nearer the middle of the breadth, when of course the ship will be less strained by the working of her guns, etc. But although some advantages are acquired by diminishing the breadth above water, we must be careful not to narrow her too much ; as there must be sufficient room left on the upper-deck for the guns to recoil. The security of the masts should likewise be remembered, which requires sufficient breadth to spread the shrouds. A deficiency of this sort may indeed be in some measure supplied by enlarging the breadth of the channels.

" With regard to the qualities required in the construction of a ship, to fit her out for the various purposes of navigation, the reader is referred to the article Bottom.

" We shall now proceed to explain the plane of elevation or sheer-draught of a modern 74-gun ship as represented in Plate 7, Fig. 2.

Elevation, or Sheer-draught.

A A, the keel ; whose upper edge is prolonged by the dotted line, upon the extremities of which are erected perpendiculars, which determine the height of the wing-transom.

B, the stern-post.

C, the stem.

D D, the quarter-gallery.

E, the quarter-piece,which limits the stern on each side.

F, the taffrail, or upper piece of the stern.

G G, profile of the stern, with its galleries.

H H H, the gun-ports.

I I I, the channels, with their dead-eyes and chain-plates.

K, the tuckrail.

L, the lower finishing.

M, the upper finishing.

N, the fretwork on the upper finishing.

O, the rudder.

P, the top timber line.

Q, the upper edge of the main-wale.

R, the lower edge of the main-wale.

S, the upper edge of the channel-wale.

T, the lower edge of the channel-wale.

U, the water-lines.

X X, the rails of the head.

Y, the knee of the head or cutwater.

Z Z, the cheeks of the head.

a, the cat-head.

b b, the hawse-holes.

"The frame timbers are represented by A C E G I K M O Q S U W Y, in the fore-body of the ship, before the midship-frame.

"⊕, represents the midship-frame, called dead-flat.

" The timbers in the after-body are represented by 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, which are erected abaft the midship-frame.

" As the eye of a spectator is supposed in this projection to view the ship's side in a line perpendicular to the plane of elevation, it is evident that the convexity will vanish, like that of a cylinder or globe when viewed at a considerable distance.

" It has been already observed that the plane of projection may be defined a vertical delineation of the curves of the timbers upon the plane of the midship-section, which is perpendicular to that of the elevation. It is necessary to observe here, that the various methods by which these curves are described, are equally mechanical and arbitrary. In the latter sense, they are calculated to make a ship fuller or narrower, according to the service for which she is designed, and in the former they are drawn according to those rules which the artist has been implicitly taught to follow, or which his fancy or judgement has esteemed the most accurate. They are generally composed of several arcs of a circle, reconciled together by moulds framed for that purpose. The radii of those arcs, therefore, are of different lengths, according to the breadth of the ship in the places where such arcs are swept ; and they are expressed on the plane of projection either by horizontal or perpendicular lines ; the radii of the breadth-sweeps being always in the former, and the radii of the floor-sweeps in the latter direction. These two arcs are joined by a third, which coincides with both, without intersecting either.

" The curve of the top-timber is either formed by a mould which corresponds to the arc of the breadth-sweep, or by another sweep, whose centre or radius are without the plane of projection. The breadth of the ship at every top-timber is limited by an horizontal line drawn on the floor-plane; and the lines of half-breadth are thus mutually transferable, from the projection and floor-planes to each other.

"The necessary data by which the curves of the timber are delineated then are, the perpendicular height from the keel, the main or principal breadth; and the top-timber breadth: for, as a ship is much broader near the middle of her length than towards the ends, so she is broader in the middle of her height than above and below; and this latter difference of breadth is continued throughout every point of her length. The main breadth of each frame of timbers is, therefore, the ship's breadth nearly in the middle of her height in that part: and the top-timber breadth is the line of her breadth near the upper end of each timber. It has been already observed, that as both sides of the ship are alike, the artificers only draw one side, from which both sides of the ship are built; therefore, the timbers before the midship-section are exhibited on one side of the plane of projection, as in Plate 7, Fig. 4, and those abaft before it on the other, as in Fig. 5.

Plane of Projection.

A, the keel.

B B, the line which expresses the upper-edge of the keel, from which the height of each timber and height of its different breadths are measured.

C C, the perpendiculars raised on the line B, to limit the ship's extreme breadth and height amidships; or, in other words, to limit the breadth and height of the midship-section.

D, a perpendicular erected from the middle of the keel, to bisect the line of the ship's breadth in two equal parts.

E, the half-breadth of the top-timber line.

F, the upper height of the main-breadth line.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, the radii of the breadth-sweeps, in the after-body, Fig. 5, abaft the midship-section.

⊕, the midship-section, called dead-flat.

A C E G I K M O Q S U W Y, are those of the radii of the breadth-sweeps in the fore-body, Fig. 4, before the midship-section.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, are the outlines of the timbers abaft the midship section, in different parts of their height.

⊖, the midship-section, called dead-flat.

A C E G I K M O Q S U W Y, are the outlines of the timbers before the midship-section, in different parts of their height.

G G, the crosses on the ticked line in the fore and after bodies, which are the radii of the floor-sweeps.

"The horizontal plane, Plate 7, Fig. 3, is composed of water-lines and ribands; it also contains the main, and top-timber breadth-lines, or the longitudinal lines by which the main-breadth and top-timber-breadth are limited in every point of the ship's length.

Horizontal Plane.

A, the diagonal or riband-line.

B, the main half-breadth line.

C, the top-timber half-breadth line.

D E F G, the horizontal, or water-lines.

I, the round aft of the stern at the height of the main-breadth.

J, the round aft of the stern at the top-timber breadth.

K, the stem.

L, the stern-post.

a c e g i k m o q s u w y, are the joints of the frame-timbers before the midship-frame.

⊕, the midship-frame, called dead-flat.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, are the joints of the frame-timbers abaft the midship-frame.

" The plane and elevation of this 74-gun ship are drawn to a scale of 1/16th of an inch to a foot.

" Thus we have endeavoured briefly to explain the nature and uses of the principal draughts used in the construction of a ship, which reciprocally correspond with each other in the dimensions of length, breadth and depth. Thus the plane of elevation is exactly of the same length with the horizontal or floor-plane. The several breadths of the timbers in the floor-plane and that of the projection are mutually transferable ; and the real height of the timbers in the projection exactly conforms to their height in the elevation.

" In the same manner, the breadths of all the timbers may be laid from the projection to the horizontal plane, and *vice versa*, from that to the projection. Thus, the height of each timber may also be transferred from the elevation to the projection, etc.

" The principal utility of these draughts, is, therefore to exhibit the various curves of the ship's body, and of the pieces of which it is framed, in different points of view, which are either transverse or longitudinal, and will, accordingly, present them in very different directions. Thus the horizontal curves of the transoms and water-lines are represented on the floor-plane, all of which are nearly straight lines in the elevation and projection ; and thus the vertical curves of the timbers are all exhibited on the projection, although they appear as straight lines in the elevation and floor-plane.

" Before this article is closed, it may be necessary to remark, that the various pieces of the hull, as well as the lines in the draughts which have not been already defined, are copiously explained in their proper places ; as it would have been contrary to the plan of this work to have given a more enlarged description of them here.

" That the reader, however, might be the better enabled to comprehend the scope of this article, it was judged necessary to give a general sketch of naval architecture itself ; to collect into one point of view the most material draughts by which a ship is constructed, and to describe, as concisely as possible, the several parts of which they are composed.

" The principal parts of a ship, also, which are here reduced into a narrow compass, are represented at large in different places of this work, to illustrate those explanations to which it may be necessary to refer, in order to understand the subject more clearly. Thus, the head, the stern, the quarter, the bow, and the midship-section, of a ship of 74-guns, are exhibited on a scale of 1/8th of a inch to a foot, in Plate 5, and Plate 3, Fig. 1 ; by which all the subordinate parts may be distinctly viewed, and their combination and arrangement, sufficiently understood. For further particulars, see the article Shipbuilding."

NAVAL HOODS ; or Hawse-Bolsters, were large pieces of plank, or thick stuff, wrought above and below the hawse-holes. See Plate 5, Fig. 4, where *e* represents the Hoods.

Bowsprit-NETTING ; a netting fastened at the outer end of the bowsprit to the horses, or man-ropes, to stow away the fore-topmast-stay-sail and jib.

NUTS, of the anchor ; two little prominences. appearing like short square bars of iron, fixed across the upper part of the anchor-shank, to secure the stock thereof in its place ; for which purpose there was a corresponding notch, or channel, cut in the opposite parts of the stock, of the same dimensions as the nuts. See the article Anchor, and the figures referred to from it.

O

ORDNANCE ; a general name for every species of artillery used in war ; as cannon, mortars, howitzers, swivels, etc. In time of service, each man was supposed to work 5 cwt. of metal ; hence may be computed the number of men required to attend each piece. For further particulars, see the articles Cannon, Gun, and Mortar.

ORLOP ; the lower but temporary deck in a ship of war, whereon the cables were usually coiled, the sails deposited, and the several officers' store-rooms contained. Small ships had a kind of platform amidships, which was also called the orlop, and was chiefly for the use of the cables.

Orlop-beams. See the article Beams.

OUT-HAULER ; a name given to a rope used to haul out the jib.-boom

P

PARRAL; an assemblage of ribs and trucks, which, with the parral-rope, formed a sort of collar (see Fig. 1, Plate 8) to attach the topsail-yards to the masts, so that the yards might slide easily up or down the masts.

The rib, Fig. 2, was made of ash-board, the diameter of the yard in length, and one-third the length in breadth. It was straight on the inner edge, and divided into two semi-circles on the back, with a hollow cavity between. Through the flat sides were bored two holes, one in the middle of each semi-circle, for the reception of the rope.

The truck, Fig. 3, was made of ash, or harder wood, the breadth of the rib in diameter, and one-third more than the diameter in length: it was turned in a lathe, and, through the centre, lengthways, was bored a hole, to answer those in the rib.

There were four kinds of parrals, viz.:

Parral-rope, was formed of a single rope, well served, and furnished with an eye at each end; this being passed round the yard, was seized fast on, the two ends were passed round the after part of the mast; and one of them being brought under, and the other over, the yard, the two eyes were lashed together with a piece of spun-yarn on the fore side of the yard: this, however, was seldom used except for the top-gallant and smaller yards.

Parral with ribs and trucks, was formed by passing the two parts of the parral-rope through the holes in the ribs, observing that between every two ribs was strung a truck on each part of the rope. The ends of the parral-ropes were made fast with seizings ; these were chiefly used on the topsail-yards.

Parral with trucks, was composed of a single rope, passing through a number of trucks, sufficient to embrace the mast ; these were calculated for the cheeks of a gaff.

Truss-parral, was formed by fixing a rope upon the middle of the yard, which, passing at the back of the mast, was rove through an iron thimble, spliced into another rope (also fastened upon the yard) and communicated with a tackle reaching to the deck, whereby it might be occasionally slackened or straightened ; ships of war generally had two of these, one leading from each side, and they were peculiar to the lower-yards.

PARTNERS ; pieces of plank fastened in certain frames which surrounded the capstans, masts, pumps, and bowsprit, for the purpose of strengthening them, and preserving them from the effects of pressure ; hence,

Partners of the Bowsprit, were three pieces of oak timber dowelled together, and bolted to the upper and lower-deck beams, to receive the heel of the bowsprit. In 74-gun ships they were about twelve inches thick, and three feet nine inches in breadth.

Partners of the Main-capstan, were several pieces of four-inch oak plank shut in the frame, and fayed to the barrel on the main-deck ; they were bolted and caulked, but the bolts were not clinched, and sufficient room was always left for the capstan to work easily, and for the admission of an iron-hoop, which projected an inch above the partners, to prevent the water from going between decks.

Partners of the Main-mast, a frame fitted in the apertures of the decks, for the reception of this mast, and was intended to strengthen the decks in those places, and particularly to secure them from the pressure of the mast.

PEAK ; a name given to the upper corners of those sails which were extended by a gaff, or by a yard, which crossed the mast obliquely, as the mizzen-yard of a ship, the main-yard of a bilander, etc. The upper extremity of those yards and gaffs was also called the peak.

Peak-halyards, were the ropes or tackles by which the outer end of a gaff was hoisted, as opposed to the Throat-halyards, which article see.

PENDANT, or Pennant ; a sort of long narrow banner, displayed from the mast-head of a ship of war, which usually terminated in two ends or points, called the swallow's tail. It signified that a vessel was in commission or actual service.

Pendant was also a short piece of rope, fixed on each side, under the shrouds, upon the heads of the main and foremasts, from which it hung as low as the cat-harpings, having an iron-thimble spliced into an eye at the lower end, to receive the hooks of the main and fore-tackles.

PILASTERS ; fluted ornaments, with base and capital fastened to the munions between the lights.

PILLARS ; pieces of wood or iron fitted under the beams of the decks to support them.

PILLOW ; a block of timber on which the inner end of the bowsprit was supported. See the article Bowsprit.

PINS; see the article Belaying-pins.

PINTLES; small mixed metal bolts, fastened upon the back part of the rudder, with their points downwards, in order to enter into, and rest upon, the braces or gudgeons, fixed on the stern-post to hang the rudder. They are represented by I in Fig. 1, Plate 5. See also the articles Rudder, Helm, and Gudgeons.

PLATES; a flat piece of iron or tin, either single or double, used for various purposes in a ship, to strengthen the part to which it was fastened.

Backstay Plates, were pieces of iron used instead of chains to confine the lower dead-eyes of the backstays.

Futtock, or Foot-hook, Plates, were narrow plates of iron attached to the dead-eyes of the topmast-shrouds. See the article Futtock.

POINTS; flat pieces of braided cordage, tapering from the middle towards each end, whose lengths were nearly double the circumference of the yard, and used to reef the courses and top-sails of square-rigged vessels: they were fastened to the sails by passing one through every eyelet-hole in the reef-bands, and making two knots upon it, one on each side of the sail, to prevent its falling out. See the article Reef.

POOP; the highest and aftmost deck of a ship.

Poop-royal, a short deck, or platform, placed over the aftmost part of the poop in the largest of the French and Spanish men of war, which served as a cabin for their masters or pilots. This was usually called the top-gallant poop by our shipwrights.

PORT-BARS; strong pieces of oak fitted in the port-sills; they were about six inches square, and, having two mortises cut near their ends, received the hooks which hooked into the port shackles. The iron hooks and wedges were attached to these bars, by which the ports were properly secured.

Port-hooks, were hooks driven through the sides of a ship, and clinched, for the purpose of hooking the hinges that were fastened to the port-lids.

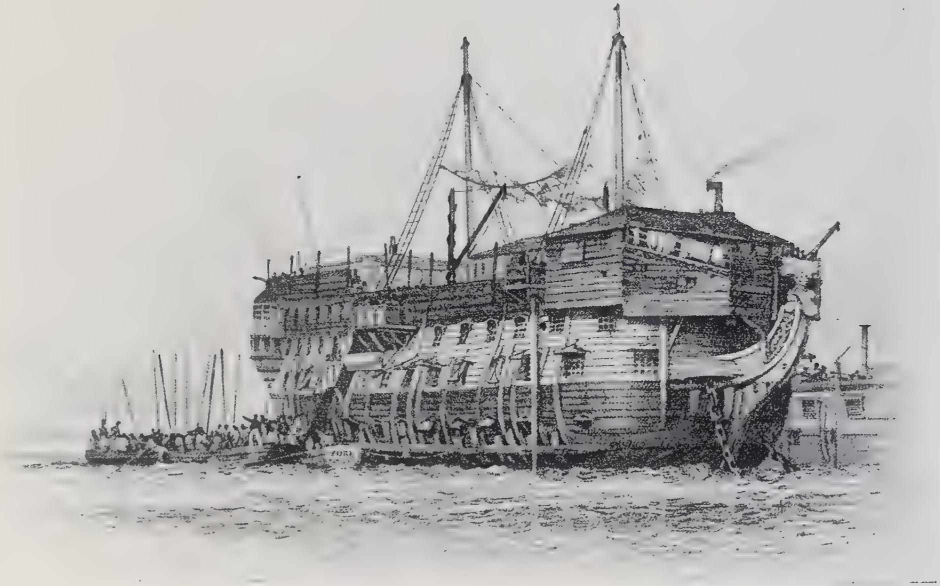
Port-lids, were hanging-doors, which shut in the ports at sea, they were fastened by hinges to their upper edges ; so as to let down when the cannon were drawn into the ship. The lower and upper ends of these ports were always parallel to the deck, so that the guns, when levelled in their carriages, were all equally high above the lower extremity of the ports. The ports are exhibited throughout the whole ship's length, by H in the elevation, Plate 7, Fig. 2 ; they are also represented upon a larger scale in Plate 5, Figs. 1 and 4. See also the articles Cannon, Deck, and Stern.

Port-riggles, the names of small semi-circular pieces of wood, about two inches thick, nailed to the ship's side over the ports, to prevent the water that might run down the side from going therein.

Port-ropes, or pendants, were ropes spliced into the rings on the outside of the port-lids : they led through the lead pipes in the ship's side, and were used to haul up the port-lids by the assistance of blocks.

Port-sashes, were glass frames put in the gun-room, ward-room, and cabin ports of a ship of war, to give light to those apartments. They were generally fastened with lanyards, and sometimes with hooks and eyes.

Port-shackles, a sort of iron ring-bolt driven through the lower-deck port-lids and clinched on their hinges,



E. W. Cooke, 1828.

PRISON-SHIP IN PORTSMOUTH HARBOUR.

Convicts Going on Board.

for the purpose of securing the port-lids, which was done by means of wedges and hooks that hooked into the rings.

PUDDING; or puddening of a mast, a thick wreath or circle of cordage, tapering from the middle towards the ends, pointed all over, and fastened about the main-mast and fore-mast of a ship, directly between the trusses to prevent their yards from falling down, when the ropes by which they were usually suspended were shot away in battle.

The pudding was made by splicing an eye at each end of a piece of rope, whose length was about twice the diameter of the mast, then firmly serving it over with spun-yarn throughout its whole length, increasing the turns from each end towards the middle, and pointing it over for neatness as represented by Fig. 5, Plate 8. It was then fitted with a lanyard which was spliced into one of the eyes, and fixed about the mast, by passing the lanyard alternately through both eyes on the fore side of the mast. See the article Dolphin.

There were also puddings for the yards made in a similar manner.

Q

QUARTER; that part of a ship's side which lay towards the stern, or which was comprehended between the aftermost end of the main-chains and the sides of the stern, where it was terminated by the quarter-pieces. Or the quarter of a ship was generally considered to be all that part aft, from the middle of the main-channel.

Fig. 1, Plate 5, represents a geometrical elevation of the quarter of a 74-gun ship as corresponding with the other figures of a ship of the same rate, delineated upon the same plate. See the articles Head, Midship-section, and Stern.

In the plane of elevation, Fig. 2, Plate 7, the quarter is continued into the side upon a smaller scale.

Reference to and explanation of Fig. 1, Plate 5.

A, the keel, with *a* the false-keel beneath it.

B, the stern-post.

C C C, the rails to the upper, middle, and lower stools to the quarter-gallery.

D D, the quarter-gallery, with its munions and windows.

E, the quarter-pieces.

F, the taffrail.

G, the braces for the pintles of the rudder to work in.

H, the gun-ports of the lower-deck.

h, the gun-ports of the upper and quarter-decks.

I, the pintles which work in the braces.

K K, the breast-rails to the quarter-gallery.

L, the lower-finishings.

Q, the upper-finishings.

R, the after part of the channel-wale, parallel to the main-wale.

S, the main-wale.

T, the rudder.

U U, the small rails over the upper-finishings.

V, the rough-tree rail.

W, the after part of the load-water-line.

k k l, the curve of the several decks corresponding to those represented in the head.

Quarter-badge. See the article Badge.

Quarter-gallery, a small balcony on the quarter of a ship which generally communicated by doors with that on the stern. See the article Gallery, and Plate 5, Fig. 1, where the quarter-gallery is represented by D D.

Quarter-pieces, were pieces of timber at the after part of the quarter-gallery, near the taffrail. In Plate 5, Fig. 1, E represents the quarter-piece, and F the taffrail.

Quarter-rails were narrow moulded planks, generally of fir, which reached from the top of the stern to the gangway, and served as a fence to the quarter-deck.

R

RABBET ; in carpentry, a deep groove or channel cut in a piece of timber longitudinally, to receive the end of a plank, or the ends of a number of planks, which are to be securely fastened therein. The depth of this channel is equal to the thickness of the plank, so that when the end of the latter is let into the rabbet, it will be level with the outside of the piece. Thus the ends of the lower planks of a ship's bottom terminated upon the stem forward and the stern-post abaft, with whose sides their surfaces were even. The surface of the garboard strake, whose edge was let into the keel, was, in the same manner, level with the side of the keel at the extremities of the vessel : hence the rabbet of the keel, of the stem, and of the stern-post.

RAILS ; narrow planks, generally of oak or fir, upon which there was a moulding stuck : they were nailed for ornament on several parts of a ship's upper works (See Plate 5, Fig. 1), as the drift-rails, fife-rails, rough-tree-rails, sheer-rails, tuck-rails, waist-rails, etc., some of which were also intended as a protective fence.

Rails of the head, were certain curved pieces of timber, extending from the bows on each side to the continuation of the stem, to support the knee of the head, and the ornamental figure fixed thereon. The former of these rails is represented in Fig. 4, Plate 5, as explained under the article Head.

RAKE; the projection of the upper part of a ship at the height of the stem and stern beyond the extremities of the keel. Rake also signified the inclination of the masts from a perpendicular situation with the keel.

RATLINES; small lines, which traversed the shrouds of a ship horizontally, at regular distances from the deck upwards, and thus formed a variety of ladders, by which to climb or to descend from any of the mast-heads.

To RATTLE DOWN the Shrouds, was to fix the ratlines to them, in order to prevent them from slipping down by the weight of the sailors: they were firmly attached by a knot called a clove-hitch, to all the shrouds except the foremost or aftmost; where one of the ends being fitted with an eye-splice, was previously fastened with twine or pack-thread.

REEF; a certain portion of a sail, comprehended between the top or bottom, and a row of eyelet holes generally parallel thereto. In large sails there were several reefs parallel to each other, thus the top-sails of a ship were usually furnished with four reefs, as shown at *l m n*, and the reef of the main-course *s*, Plate 8, Fig. 6, parallel to the yard; and there were always three or four reefs, parallel to the bottom on those main-sails and fore-sails which were extended upon booms.

Reef-band, a piece of canvas sewn across the sail to strengthen it in the place where the eyelet-holes of the reef were formed.

Reef-hanks, were short pieces of small line, sewn at certain distances, on the reefs of boom-sails.

Reef-tackle, a rope which passed from the deck through a block at the topmast-head, and thence to another block at the topsail-yardarm, where it communicated with another rope that ran downwards through a hole in the yard, and was afterwards attached to a cringle, a little below the lowest reef. It was used to pull the skirts of the topsails close up to the extremities of the topsail-yards, in order to lighten the sail, the weight of which would otherwise have rendered it very difficult to perform this operation.

RIBBANDS, or Ribands; long narrow flexible pieces of timber, nailed upon the outside of the ribs, from the foremost to the aftmost square-timbers, so as to encompass the ship lengthways. (See Plate 13, Fig. 3.)

The ribbands, being judiciously arranged with regard to their height and distance from each other, and forming regular sweeps about the ship's body, composed a kind of frame, whose interior surface determined the curve of all the intermediate or filling timbers which were stationed between the principal ones. As the ship's bottom approached to that of a conoid, and the ribbands had a limited breadth, it is apparent that they could not be applied to this convex surface without forming a double curve, which was partly vertical and partly horizontal ; so that the vertical curve increased by approaching the stem, and still more by drawing near the stern-post. It is also evident, that by deviating from the middle-line of the ship's length, as they approached the extreme breadth at the midship-frame, the ribbands also formed an horizontal curve.

The floor-ribband was terminated by the foremost and aftmost square-timbers.

The first futtock-ribband was placed between the floor and lower futtock-head.

The second was placed between the first and second futtock-heads.

The third was placed between the second and third futtock-heads.

The fourth was termed the main-breadth ribband. Those ribbands were connected with the harpings, and reached fore and aft the ship in the wake of the square-timbers. See the article Harpings.

RIGGING ; a general name given to all the ropes employed to support the masts ; and to arrange or reduce the sails, or arrange them to the disposition of the wind.

In rigging a mast, the first thing usually fixed upon its head was a circular piece of rope, called a grommet or collar, which was firmly beaten down upon the top of the hounds. The purpose of this was to prevent the shrouds from being fretted or worn by the trestle-trees, or shoulders of the mast ; after this were laid on the two pendants, from whose lower ends the main or fore-tackles were suspended ; and next the shrouds of the starboard and port sides in pairs alternately. The whole was covered by the stays, which were the largest ropes of the rigging. See the article Mast.

When a yard was to be rigged, a grommet was also driven first on each if its extremities: next to this were fitted on the horses, the braces; and, finally, the lifts, or top-sail-sheet blocks; all of which are explained in their proper places.

Lower-Rigging, denoted the shrouds, stays, etc., which were set up, and firmly attached to the lower masts.

Standing Rigging, was that which was employed to sustain the masts, and which remained in a fixed position; as the shrouds, stays and backstays.

Running Rigging, was that which was fitted for the purpose of arranging the sails, by passing through various blocks in different places about the masts, yards, shrouds, etc., as the braces, sheets, halyards, clew-lines, etc.

The names, with a description and use of the various ropes which comprised the rigging of ships, will be found in this work under their respective heads. See also the article Ships, and Plate 15.

RING-TAIL; a small quadrilateral sail, extended on a little mast, which was occasionally erected for that purpose on the top of a ship's taffrail, the lower part being stretched out by a boom, which projected from the stern horizontally. This sail was only used in light or favourable winds.

Ring-tail Sail, was also a name given to a sort of studding-sail, hoisted beyond the after-edge or skirt of those main-sails which were extended by a boom and gaff over the stern; as in all sloops, brigs, and schooners. The two lower corners of this sail were stretched out to a boom, called a

Ring-tail Boom which rigged in and out upon the main or driver-boom, in the same manner as the studding-sail boom did on the topsail-yards.

Port-RINGS, or Shackles ; iron rings about seven-eighths of an inch thick, and four inches diameter in the clear : they were clinched both inside and outside the lower parts of the port-lids : the two on the outside of the port-lid were used by means of tackles to haul it up ; and the other two were for securing it inside by means of the port-fastenings.

RISING-LINE ; a name given by shipwrights to an incurvated line, which is drawn on the plane of elevations or sheer-draughts (see Plate 7, Fig. 2) to determine the height of the ends of all the floor-timbers throughout the ship's length, and which accordingly ascertained the figure of the bottom, with regard to sharpness or flatness. See the article Naval Architecture.

ROACHING a Sail ; a term used by sail-makers to signify the allowance made for the beauty in the appearance of a sail, as well as allowing for belly, etc.

ROBINS, or Rope-bands ; pieces of small rope or braided cordage, having an eye at one end ; they were used in pairs to secure the upper edges of the square sails to their respective yards, the long leg passing over the yard two or three times round, and the short leg coming under, was tied to it upon the yard.

ROPES ; in a general sense, denoted all sorts of cordage, above one inch in circumference, used in rigging ships; they had different names, according to their various uses, as Cable, Hawser, Tow-line, Warp, etc.

RUDDER; a long flat piece of timber, hung by pintles to the gudgeons or braces, on the aftmost part of a ship's stern-post, being nearly even with the false keel, as represented by T, Fig. 1, Plate 5. See the articles Helm and Gudgeon.

S

SADDLE; a small cleat, or block of wood, hollowed on the upper and lower sides, and nailed upon the lower yard-arms, to retain the studding-sail-booms in a firm and steady position: for this purpose, the cavity on the lower part of the saddle conformed to the cylindrical surface of the yard to which it was attached; and, in like manner, the hollow on the upper side answered to the figure of the boom, and served as a channel whereby it might run out or in, along the yard, as occasion required.

Saddle of the Bowsprit, a name given to a semi-circular piece of wood, which was shaped and fastened to the upper part of the bowsprit, boom, etc.

Saddle was also the name given to a piece of elm timber fitted on the upper end of the lacing.

SAIL; an assemblage of several breadths of canvas, or other material, sewn together, and extended on or between the masts, to receive the wind and impel a vessel through the water.

The edges of the cloths, or pieces of which a sail was composed, were generally sewn together with a double seam; and the whole skirted round the edges with a cord, called the bolt-rope.

Although the form of sails was extremely different, they were, nevertheless, either triangular or quadrilateral; or, in other words, their surfaces were contained either between three or four sides. The former of these were sometimes spread by a yard, as lateen sails; or by a stay, as stay-sails; or by a mast, as shoulder-of-mutton sails; in all of which cases, the foremost leech or edge was attached to the said yard, stay, or mast, throughout its whole length. The latter, or those which were four-sided, were either extended by yards, as the principal sails of a ship, or by yards and booms, as the studding-sails, drivers, ring-tails, and all those sails which were set occasionally; or by gaffs and booms, as the main-sails of sloops, brigs, etc.

The principal sails of a ship (Plate 8, Fig. 6) were the courses or lower sails, *a a*; the topsails, *b b*, were next in order above the courses; the top-gallant-sails, *c c*, were expanded above the top-sails; the top-gallant-royal-sails, A A, were expanded above the top-gallant-sails; and sometimes another sail, called a sky-scraper, was expanded above the top-gallant-royal-sails.

The courses were, the main-sail, fore-sail, and mizzen; main-stay-sail, fore-stay-sail, and mizzen-stay-sail; but more particularly the three first.

The main-stay-sail was rarely used except in small vessels.

In all square sails, the upper edge was called the head; the sides or skirts were called the leeches; and the bottom or lower edge was called the foot: if the head was parallel to the foot, the two lower corners were denominated clews, and the upper corners earings.

In all triangular sails, and in those square sails in which the head was not parallel to the foot, the foremost corner at the foot was called the tack, and the after lower corner the clew; the foremost edge was called the fore leech, and the hindmost the after leech.

The heads of most square sails, and the fore leeches of lateen sails, were attached to their respective yard or gaff by a number of small cords called rope-bands, or robins, and the upper extremities were tied to the yard-arms, or to the peak of the gaff, by earings.

The stay-sails were extended upon stays between the masts, on which they were drawn up or down as required, as a curtain slides upon its rod, and their lower parts were stretched out by a tack and sheet. The clews of a topsail were drawn out to the extremities of the lower-yard by two large ropes, called the topsail-sheets; and the clews of the top-gallant-sails were in like manner extended upon the topsail-yard-arms, as shown in Plate 8, Fig. 6.

The studding-sails were set beyond the leeches or skirts of the main-sail and fore-sail, or of the top-sails or top-gallant-sails of a ship. The lower edges of the lower-studding-sails, represented by *o o*, were extended by a boom, hooked into an eye, and fixed in the main-channel for that purpose.

The top-sail-studding-sails, *p p*, were extended by studding-sail-booms, run out beyond the extremities of the main-yard.

The top-gallant-studding-sails, *q q*, were also extended by studding-sail-booms, run out from the top-sail-yard.

All sails derived their names from the mast, yard, or stay, upon which they were extended. Thus the principal sail extended upon the main-mast, was called the main-sail or main-course, *d*, Fig. 1, Plate 16; the next above, which stood upon the main-topmast, was termed the main-topsail, *e*; and that which was spread across the main-top-gallant-mast, was termed the main-top-gallant-sail, *f*; above which there was the main-top-gallant-royal, 2.

In the same manner there were, the fore-sail, or fore-course, *g*; the fore-top-sail, *h*; the fore-top-gallant-sail, *i*; the fore-top-gallant-royal, 1; the driver, *k*; the mizzen-topsail, *l*; the mizzen-top-gallant-sail, *m*; and the mizzen-top-gallant-royal, 3. Thus, also, there were the main-stay-sail, *o*; main-topmast-stay-sail, *p*; and main-top-gallant-stay-sail, *q*; with a middle stay-sail which stood between the two last, and a royal-stay-sail, 4; all these stay-sails were between the main and fore-masts.

The stay-sails between the main and mizzen-masts were, the mizzen-stay-sail, *r*, and the mizzen-top-mast-stay-sail, *s*.

The sails between the foremast and the bowsprit were, the fore-top-mast stay-sail, *t*, the jib, and sometimes a flying-jib, *u*. There were, besides, two square sails extended by yards under the bowsprit and jib-boom; the first of which was called the sprit-sail, *y*, and the second the sprit-sail-top-sail.

For the other sails of a ship, such as the gaff-top-sail, ring-tail, sky-scraper, etc., see these articles.

The ropes by which the lower yards of a ship were hoisted up to their proper height on the masts, were called the jears. In all other cases, the ropes employed for this purpose were called halyards; hence the sails were extended by halyards, tacks, sheets, and bow-lines; and were drawn up together, or trussed up, by bunt-lines, clew-lines, *d d*; leech-lines, *e e*; reef-tackles, *f f* ; and lift-tackles, *g g* ; which are represented in Plate 8, Fig. 6. As the bunt-lines and leech-lines passed on the other side of the sail, they are expressed by dotted lines in the same plate. The higher studding-sails, and, in general, all the stay-sails, were drawn down, so as to be furled, or taken in, by down-hauls. The courses, top-sails, and top-gallant-sails, were wheeled about the mast, so as to suit the various directions of the wind, by braces.

After Sails, were those that belonged to the main and mizzen masts.

Shoulder-of-mutton Sails were triangular, and similar to lateen sails ; but were attached to masts instead of yards.

SCARPH ; to unite any two pieces of timber together by the extremities, so that the end of one goes over the end of the other, being tapered so that one may be let into the other and become even, as the keel-pieces, clamps, etc. But when the ends of the two pieces were cut square and put together, they were said to butt to one another ; and when another piece was laid on and fastened to both, as was the case in all the frame-timbers, this was called scarphing the timbers ; and half the piece which fastened the two timbers together, was reckoned the length of the scarph.

SCHOONER ; a small vessel with two masts, whose main and fore-sails were suspended by gaffs, reaching from the mast towards the stern ; and stretched out below by booms, whose foremost ends were hooked to an iron which clasped the mast so as to turn therein as upon an axis, when the after ends were swung from one side of the vessel to the other.

This vessel was generally a fast sailer, and principally employed in trade by those who made speculations where dispatch was requisite. (See Plate 16, Fig. 3.)

SCROWL; a name given to the two pieces of fir timber which were bolted to the knee of the head, and served in lieu of a figure.

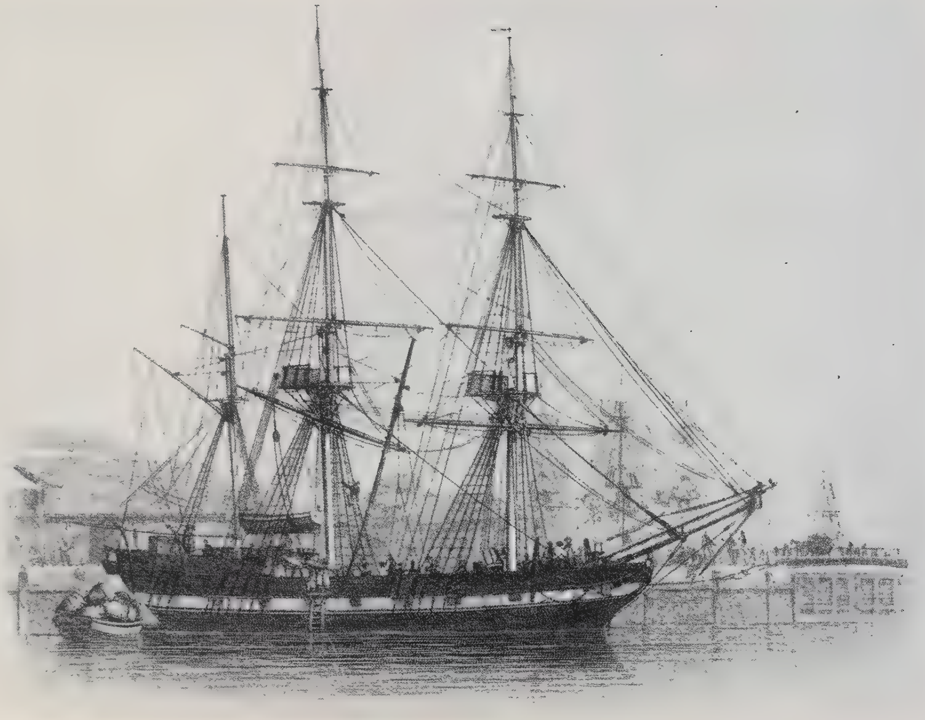
SCUPPERS; certain channels cut through the water-ways and sides of a ship, at proper distances, and lined with sheet lead, in order to carry the water off the deck into the sea.

SCUTTLE; a small hatchway or hole, cut for some particular purpose through a ship's deck or sides, or through the coverings of her hatchways or ladder-ways, and furnished with a lid which firmly enclosed it when necessary. See Plate 4, where U *u* show the positions of the scuttles leading to the gunners' store-room and the bread-room respectively.

SHEATHING; a sort of casing or covering nailed all over the outside of a ship's bottom, to protect the planks from the pernicious effects of worms, particularly in hot climates. It consisted of a number of fir boards or deals of fir, or what was far preferable, sheets of copper, which last was coming into general use in the Royal Navy at the end of the 18th century.

SHEER; the longitudinal curve of a ship's deck or sides.

SHEER-STRAKE; the strake under the gunwale in the topside; it was generally worked thicker than the rest of the topside and scarphed between the drifts. It is represented by S in Plate 3, Fig. 1.



E. W. Cooke, 1828.

BARQUE. FREE TRADER, LONDON DOCKS.

SHEET; a rope fastened to one or both the lower corners of a sail, to extend and retain it in a particular station.

When a ship sailed with a side wind, the lower corners of the main and fore-sails were fastened by a tack and sheet, the former being to windward, and the latter to leeward; the tack was, however, entirely disused with a stern wind; whereas the sail was never spread without the assistance of one or both of the sheets.

The stay-sails and studding-sails had only one tack and one sheet each; the stay-sail-tacks were always fastened forward, and the sheet drawn aft; but the studding-sail-tacks drew the outer clew of the sail to the extremity of the bottom, while the sheet was employed to extend the inmost.

SHIP; a general name given to all large vessels navigated upon the ocean. In the sea language, however, it was more particularly applied to a vessel furnished with three masts, each of which was composed of a lower-mast, top-mast, top-gallant-mast, and royal-mast, with the yards and other gear belonging thereto. See also the articles Naval Architecture, and Ship-building.

A ship of the line, usually applied to all men of war carrying 60 guns and upwards. Ships of 74 guns were generally esteemed the most useful in battle, and we have therefore represented different views and sections of a ship of this class.

Plate 15 represents a first-rate ship of war, with masts, yards, sails, rigging, etc., at anchor; the several parts of which were as follow:

1 Bowsprit.
2 Gammoning.
3 Bumkin.
4 Horse.
5 Bob-stays.
6 Martingal.
7 Martingal-stays.
8 Bowsprit-shrouds.
9 Jib-boom.
10 Jib, stay, and sail.
11 Jib-halyards.
12 Horses.
13 Sprit-sail-yard and course.
14 Bowsprit-cap.
15 Jack-staff and flag.
16 Braces.
17 Fore-mast.
18 Shrouds and Ratlines.
19 Stay and lanyard.
20 Preventer-stay and lanyard.
21 Yard and horse, with studding-sail-booms.
22 Horse.
23 Top.
24 Yard tackles.
25 Lifts.
26 Braces.
27 Sheets.
28 Tack.
29 Bowlines and bridles.
30 Futtock-shrouds.
31 Cap.
32 Fore topmast.
33 Shrouds and lanyards.
34 Yard and sail, with studding-sail-booms.
35 Stay and sail.
36 Preventer-stay.
37 Backstays.
38 Halyards.
39 Lifts.
40 Braces.
41 Horses.
42 Staysail halyards.
43 Bowlines and bridles.
44 Sheets.
45 Cross-trees.
46 Cap.
47 Fore-top-gallant-mast.
48 Shrouds.
49 Yard and sail.
50 Backstays.
51 Stay.
52 Lifts.
53 Braces.
54 Bowlines and bridles.
55 Royal stay.
56 Backstay.
57 Royal yard and sail.
58 Royal braces.
59 Royal lifts.
60 Flag of the Lord High Admiral.
61 Main-mast.
62 Shrouds and ratlines.
63 Stay.
64 Preventer-stay.
65 Stay-tackles.
66 Yard-tackles.
67 Lifts.
68 Braces.
69 Horse.
70 Sheets.
71 Tack.
72 Bowlines and bridles.
73 Top.
74 Cap.
75 Yard and course, with studding-sail-booms.
76 Futtock-shrouds.
77 Main-top-mast.
78 Shrouds and lanyards.
79 Yard and sail, with studding-sail-booms.
80 Backstay.
81 Preventer-stay.
82 Stay and sail.
83 Halyards.
84 Lifts.
85 Braces.
86 Horse.
87 Sheets.
88 Bowlines and bridles.
89 Cross-trees.
90 Cap.

91 Main-top-gallant-mast.
92 Shrouds.
93 Yard and sail.
94 Backstay.
95 Stay, halyard, and sail.
96 Lifts.
97 Braces.
98 Bowlines and bridles.
99 Royal stay.
100 Backstay.
101 Royal yard and sail.
102 Royal Braces.
103 Royal lifts.
104 Royal standard.
105 Mizzen-mast.
106 Shrouds and ratlines.
107 Cross-jack-yard.
108 Stay.
109 Preventer-stay.
110 Cross-jack-lifts.
111 Cross-jack-braces.
112 Horse.
113 Top.
114 Cap.
115 Mizzen-top-mast.
116 Shrouds.
117 Stay.
118 Backstay.
119 Yard and sail.
120 Lifts.
121 Braces.
122 Bowlines and bridles.
123 Cross-trees.
124 Cap.
125 Mizzen-top-gallant-mast.
126 Shrouds.
127 Stay.
128 Backstay.
129 Yard and sail.
130 Bowlines and bridles.
131 Lifts.
132 Braces.
133 Royal yard and sail.
134 Royal lifts.
135 Royal braces.
136 Royal stay.
137 Royal back-stays.
138 Union jack.
139 Driver-boom.
140 Boom topping-lifts.
141 Boom guy-falls.
142 Gaff and driver.
143 Derrick-fall.
144 Peak-brails.
145 Peak-halyards.
146 Ensign staff.
147 Ensign.
148 Bower cable.

The plans, elevations, and sections used in the construction of a ship; the principal pieces of which she was composed; and the qualities required to answer the several purposes of navigation, are described, or referred to, in the article Naval Architecture; and the application of this theory to practice is treated in the article Shipbuilding.

The machinery and furniture with which she was equipped are variously distributed throughout this work, and naturally spring from one another, like a multitude of branches from one general trunk. See the articles Mast, Sail, Yard, Rigging, Anchor, etc.

Merchant SHIP ; a vessel employed in commerce, to carry commodities of various sorts from one port to another (*N.B.*—This article is taken from the first edition (1759) of Falconer's Dictionary, as also are the Plates referred to in it.)

The largest merchant ships of the period were those employed by the different European companies of merchants who traded with the East Indies. They were in general somewhat larger than our 40-gun ships : they were mounted with twenty cannon on their upper-deck, which were nine-pounders, and six on their quarter-deck, which were six-pounders. Plate 9 represents a view of one of these vessels on the starboard bow, where *a* is the ensign-staff, A the mizzen-mast, B the main-mast, C the fore-mast, K the poop, LL an awning of wood extending across the after part of the quarter-deck, M the poop-ladder, N O steps of the gang-way, P head of the capstan on the quarter-deck, Q R the skids on the gang-way, *r* the belfry on the forecastle, *s* the timber-heads, *y* the cut-water, with a lion's head fixed upon it.

Plate 10, exhibits a quarter view of a foreign-built East Indiaman with a square tuck or perpendicular counter, and having three poop-lanterns fixed on her taffrail.

SHIPBUILDING ; the art of erecting ships from a certain draught, and was performed by scarphing, rabbeting, tenoning, scoring, facing, and bolting. It is distinguished from naval architecture, the former being the practice of building ships, and the latter the theory of delineating them. It may, however, be necessary to observe, that, as the theory ought always to precede the practice, this article would probably be much better understood by previously perusing that of Naval Architecture, which may be considered as a proper introduction to it.

We shall here attempt to describe the various parts of a 74-gun ship, and, at the same time, show how these parts were progressively applied and connected with each other, according to the practice of building in vogue at the end of the 18th century, from the laying of the keel to the launching of her into the water.

The timbers being provided, the blocks were laid in the middle of the slip, about five feet distant from each other, to receive the keel ; the lower being much larger than those above, were therefore, fastened upon the groundways, and the upper ones upon the lower with tree-nails ; their declivity was generally from five-eighths to three-quarters of an inch to a foot ; the upper sides being laid straight fore and aft and level athwartships.

The Keel was formed of several pieces of elm timber, scarphed perpendicularly and bolted together, and was the basis for the whole structure ; it was set straight upon the middle of the blocks, and kept in that position by tree-nails being driven into the blocks along its sides.

The Dead-wood was generally of oak of various forms and thicknesses, and fayed on the upperside of the main-keel, the scarphs giving shift to the scarphs of the keel, and fastened thereto by tree-nails.

The Floors were also of oak, fixed athwartships, and scored into the dead-wood.

The Stem was composed of two or more circular pieces of oak timber, which were scarphed and bolted together : its lower end was scarphed or boxed into the fore end of the main-keel, and its upper end extended to the under side of the bowsprit.

The Apron was also of oak and conformed to the shape of the stem; the convexity of the former, fayed to the concavity of the latter, formed one solid piece.

The Knight-heads were of oak, their heads were sufficiently above the head of the stem to support the bowsprit: narrow timbers, or fillings, were latterly introduced between the knight-heads and the stem, in order to prevent the bowsprit from wounding them. The stem, apron, knight-heads, and the narrow timbers, or fillings, were all bolted together and raised to their proper stations; the scarph, or boxing of the stem was then bolted securely to the fore part of the keel.

The Stern-post of oak, was the principal piece of timber in the stern-frame, and into which the wing-filling, and deck transoms were scored and bolted. Its lower end was tenoned over the keel, and its upper end terminated at the under side of the lower-deck-transom.

The Inner-post was fayed to the fore side of the stern-post, for the purpose of seating the transom below the deck; its lower end was tenoned into the keel, and its upper end terminated at the under side of the lower-deck-transom.

The Transoms were of oak, fixed athwart the stern-post, and bolted thereto, in order to form the buttock of the ship, and to fortify her after-part. They were divided into four sorts—viz., wing, filling, lower-deck, and the others below were distinguished by numbers.

The Wing-transom was the upper transom in the stern-frame, in which the heels of the counter-timbers were let in and bolted.

The Filling-transom was the intermediate transom, which was placed sufficiently above the deck-transom to admit the plank of the deck being worked between them.

The Deck-transom was next below the filling-transom, and was worked sufficiently broad to secure the after end of the gun-deck plank.

The Transoms below the lower-deck-transom were, with those described above, bolted to the stern-post, as before mentioned.

The Fashion-pieces were of oak, so-called from their fashioning the after-part of the ship, and had scores taken out of their after sides, in order to receive the ends of all the transoms. The stern-frame being now raised and secured, formed the basis of the whole stern.

The Harpings, called the floor-surmark, were pieces of oak, similar to the ribbands; they were trimmed and bevelled to the shape of the body of the ship in the wake of the fore and after cant-bodies, and were shored securely to keep the timbers in their respective stations.

The Ribbands, also called the floor-surmark, were of fir timber, nailed to the timbers of the square-body; their fore and after ends were scarphed to the harpings, which extended from the stem to the stern; they were also shored securely to retain the floor-timbers and the heels of the first futtocks in their respective stations.

The Frame-timbers were the bends of timbers forming the body of the ship, each of which was composed of a first, second, third, fourth futtock, and a top-timber, which being united, were raised cross-spalled to their respective stations, shored and bolted sideways to the floor-timbers.

The Cross-spalls were pieces of fir plank, nailed, in a temporary manner, athwart the ship in the wake of the ports, by which the frames were kept well to their breadth.

The whole of the harpings and ribbands were then trimmed and fastened to their respective stations, till the plank was wrought.

The Filling-timbers were intermediate timbers placed between the frames; they were trimmed and placed in their stations singly, and secured by ribbing-nails through the harpings and ribbands.

The Side Counter-timbers were of oak, and took the shape of the top-side, their lower ends being placed at the extremity of the wing-transom, and bolted to the foremost fashion-pieces.

The Midship Counter-timbers were also of oak; their lower ends were let into the wing-transom, and bolted thereto: they were fixed at equal distances from each other, in order to form the stern-lights, and all the stern-rails were firmly bolted to them.

The Hawse-pieces were oak timbers, whose sides stood nearly fore and aft, and formed the bow of the ship.

The Cross-chocks were pieces of oak timber which crossed the dead-wood, and secured the heels of the lower futtocks.

The Angular Chocks were fastened to the different heads and heels of the different timbers; when they were completed, the outside frame of the ship was reconciled, and the inside dubbed to its scantling ready to receive the plank.

The Kelson was composed of long square pieces of oak timber, scarphed together in a horizontal direction, and fixed within board exactly over the keel; it was fitted to, and laid upon, the floor-timbers, and bolted through the floors and the keel, the scarphs giving shift to the scarphs of the keel.

The Stemson was a piece of compass-oak timber, worked on the aft-side of the apron, having its lower end scarphed into the kelson, which gave shift to the scarphs of the apron, and its upper end continued as high as the upper-deck.

The Postson, or Sternson, was a large knee-piece of oak timber worked upon the after dead-wood ; the fore end was scarphed into the kelson, and the aft-side fayed and bolted to the fore-side or throats of the transoms, and continued as high as the lower-deck transom.

The Dead-wood Bolts were long copper bolts driven through the kelson, dead-wood, and keel, where they were well clinched upon copper rings for the purpose of securing the ship in that part.

The Lower-deck Ports were then trimmed out to their proper size, and the heads and heels of the timbers cut off in order to let in the port-sills.

The Lower-deck Port-sills were pieces of oak timber let in horizontally between the frames, to form the upper and lower sides of the ports.

The Main-wale (black-strake and diminishing-stuff) was the lower-wale, which was wrought, fastened with bolts, and bored off, but the tree-nails were not driven through it, until the inside plank was worked : it was generally placed on the lower-breadth, so that the fastenings of the knees or chocks, to the ends of the beams, might be secured to it by the in and out bolts.

The Fillings were pieces of timber driven edgeways between the timbers from the floor-heads downwards to the dead-wood, and caulked within and without board to prevent the ship from leaking.

The Plank of the bottom was wrought and bored off, and sufficiently fastened with bolts made for that purpose, but the tree-nails were not driven in until the inside plank was worked.

The Orlop Clamps were thick plank worked within the ship, and the ends of the beams were let into them: the tree-nail holes were then put through from the outside, and the tree-nails driven through and wedged, by which means the inside and outside planks were secured; the butt-bolts were afterwards driven, which completed the fastening of the plank.

The Orlop Beams were substantial pieces of oak timber, scarphed, dowelled, and bolted together, they were laid athwarthships to support the orlop-deck, and to keep the sides of the ship together by means of chocks with their iron-plate-knees or wooden knees.

The Lower-deck Clamps were also thick plank worked within the ship, and fastened in a similar manner to the orlop-clamps above mentioned.

The Lower-deck Beams were also substantial pieces of oak timber, scarphed, dowelled, and bolted together; they were laid athwartships to support that deck, etc., by means of chocks and iron-plate-knees, which were bolted both to the chocks and to the ends of the beams; these plate-knees had ears attached to them, and were made to receive two in and out bolts; these ears substituted lodging-knees.

The Lower-deck Hook, was a large piece of compass timber fixed inside athwart the bow of the ship, to which it was firmly bolted; its upper side was trimmed to the round of the beam to receive the plank of the deck.

The Lower-deck Spirketting was thick plank wrought within board; its lower edge was wrought a sufficient distance from the beam to admit the water-way, and the upper edge kept well within the upper edge of the lower-port-sills, and fastened similar to the orlop-clamps, as before mentioned.

The Transom-knees were pieces of compass timber, bolted to the wing-transom and to the sides of the ship, in the direction of the transom; being the principal security to the ends of the wing-transom.

The Upper-deck Ports were next trimmed out to their proper size, and the heads and heels of the timbers cut off, in order to let in the port-sills.

The Upper-deck Port-sills were let in as the lower-deck port-sills before mentioned.

The Channel Wale was thick plank worked between the upper and lower-deck ports, the chain and preventer-bolts being driven through it.

The Upper-deck Clamps were thick plank worked within the ship, and fastened similar to the lower-deck plank.

The Upper-deck Beams were substantial pieces of oak timber, scarphed, dowelled, and bolted together; they were laid athwartships to support that deck, etc., by means of chocks and plate-knees, the latter being bolted to the former and to the ends of the beams, as in the lower-deck.

The Upper-deck Hook was a piece of compass timber fixed inside athwart the bow of the ship, and bolted, etc., as the lower-deck hook.

The Upper-deck Transom was a piece of oak timber whose upper side was trimmed to the round of the beam, and bolted to the counter-timbers to receive the after end of the deck-plank: its ends were fastened by knees, which cast under the upper-deck beams, and were securely bolted to the transom and side of the ship.

The Upper-deck Spirketting was thick plank worked within board, similar to the lower-deck spirketting above mentioned.

The Quarter-deck and Forecastle-ports were then trimmed out to their proper size, and the port-sills were let in as the upper-deck port-sills above mentioned.

The Sheer-strake was thick plank wrought on to the top-sides, and its upper edge was kept well within the top timber-lines, or top of the side.

The Forecastle and Quarter-deck Clamps were thick plank worked within the ship, and fastened as the upper-deck clamps.

The Forecastle and Quarter-deck Beams were substantial pieces of oak timber, scarphed, dowelled, and bolted together, etc., the same as the upper-deck beams.

The Quarter-deck Transom was trimmed as the round of the beam, and bolted to the stern-timbers to receive the after ends of the deck-plank ; its ends were fastened by knees, which cast under the quarter-deck beams, etc.

The Forecastle-deck Hook was a piece of compass timber fixed inside athwart the bow of the ship and bolted thereto as the upper-deck hook before mentioned, in consequence of the beak-heads being discontinued, and round bows introduced into the service.

The Quarter-deck and Forecastle Spirketting was wrought within board, etc., similar to the upper-deck spirketting ; and the short stuff between the ports was worked and sufficiently fastened.

The Round-house Clamps were worked within the ship, and secured like the Quarter-deck planks.

The Round-house Beams were of small scantling, generally of one piece, placed athwartships; their ends were secured by chocks and plates, or hanging and lodging-knees.

The Round-house Transom was bolted to the stern-timbers, and trimmed to the same round as the beams; a rabbet was taken out of the upper side to receive the deck planks, and its end was secured by iron-knees.

The Limber-strake was thick oak plank, wrought near the kelson with a rabbet trimmed out on the midship side, to receive the limber-boards.

The Thick-plank, at the floor and first futtock-heads, were applied to strengthen the ship at the different heads and heels of the timbers.

The Foot-waling or Ceiling was composed of plank which was placed between the several pieces of thick-stuff.

The Breast-hooks were compass pieces of oak timber, fayed and bolted athwart the bow of the ship, where they were the principal security.

The Crutches were also compass pieces of oak timber, fayed and bolted on the foot-waling abaft, for the security of the after part of the ship.

The Sleepers were also compass pieces of oak timber fayed and bolted to the transoms and sides of the ship within board, in a diagonal direction, to strengthen the buttock.

The Bends or Riders in the hold were interior timbers which combined and strengthened the ship; they were fayed on the foot-waling and crossed the kelson, their upper ends continued as high as the orlop and lower-deck beams, and were fayed and bolted through the sides of the ship ; they were distinguished by floor, and first, second, and third futtocks.

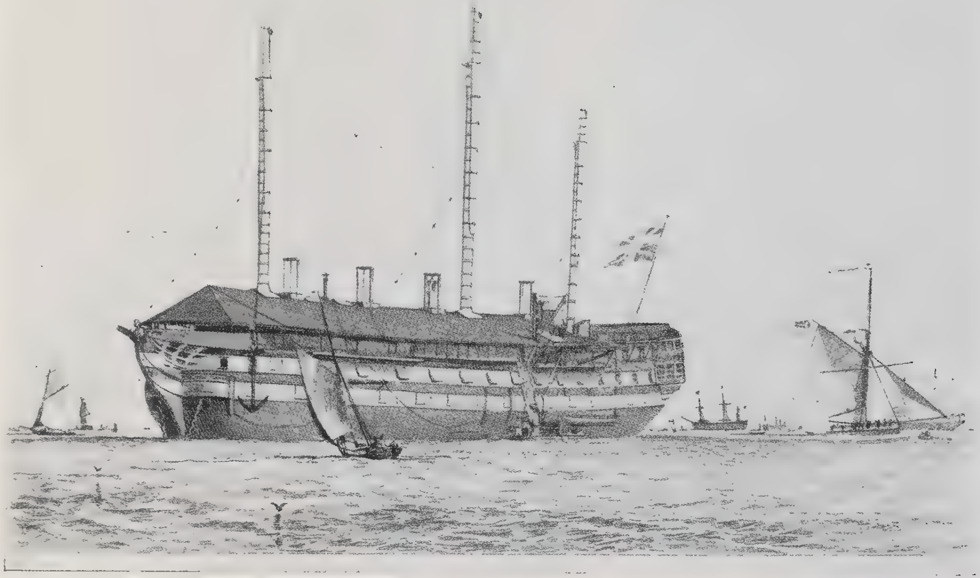
The Limber-boards were composed of short pieces of oak, having their grain placed fore and aft, except in the wake of the hatchways, where it ran up and down ; they served to keep the dirt, etc., from getting into the limber-passage ; their lower edges were fitted into the rabbet of the limber-strake, and the upper edges fayed and fitted against the sides of the kelson.

The Pillars were straight pieces of oak timber erected perpendicularly under the middle of the beams to support the orlop ; their heels were chased into the kelson, and their heads tenoned into the beams.

The Bulk-heads in the hold, were various partitions separating one part of the ship from the other ; they were built with rabbeted and cyphered-edged planks : those erected in the main-hold had their seams battened over ; those for the magazine and spirit-room were lined with thin deal, and had cement applied between them to prevent accidents from fire, etc.

The Orlop was the deck beneath the lower gun-deck, and was supported by an oak pillar placed under each beam, and framed with carlings and ledges to receive the plank, which were generally of three-inch fir. On this deck were erected the purser's, surgeon's, boatswain's, gunner's, and carpenter's cabins and store-rooms ; the midshipmen's berths, the captain's and lieutenants' store-rooms, the purser's slop-room, the steward's room, and a place for the marine clothing. The greater part of this deck was also used for stowing and coiling the cables.

The Lower Gun-deck was that next the orlop, also supported by an oak pillar under each beam, and framed with carlings and ledges to receive the plank,



E. W. Cooke, 1828.

THE "HASTINGS." SEVENTY-FOUR.

Lying in Ordinary in the Medway.

which was of four-inch oak, and on which the lower tiers of guns, consisting of 32-pounders, were placed.

The cabins for the junior lieutenant and chaplain were erected aft upon this deck, as also a gun-room for the midshipmen to mess in.

The Upper-deck was next above the lower gun-deck, and was also supported by an oak pillar under each beam, and framed with carlings and ledges to receive the deck plank, which was three-inch fir, and on which the upper tiers of guns, consisting of 24 or long 18-pounders, were placed. On this deck, the ward-room aft, with the lieutenants', master's, and captain of marines' berths were erected with screen bulkheads, which were readily taken down on going into action. The cook-room, with the fire-hearth, were placed abaft the foremast; and the top-sail-sheet and jear-bitts were also placed on this deck.

The Quarter-deck was next above the upper-deck, and was of three-inch fir plank; it was supported by oak pillars, except those in the wake of the jear-capstan, and they were of iron; they were hung to the beams and hooked up when the capstan was working. On this deck, the captain's cabin aft, and the steering wheel which worked the tiller, were erected; also the fore-brace-bitts for bracing the yards; and the blocks—viz., the main-lifts, the main-top-sail halyards, and cheek-blocks: it also contained 24-pounder and 32-pounder carronades.

The Forecastle, which was also above the upper-deck, was of three-inch fir, and supported by iron pillars; on it the blocks belonging to the fore-tacks, cat, top-sail-halyards, and fore-lifts were placed.

The Skid-beams were of fir timber, fixed in a range between the quarter-deck and forecastle; they had two fir pillars under each of them, and were used for the purpose of stowing away spars, booms, boats, etc.

The Round-house, aft, was that part above the quarter-deck, forming a covering to the captain's cabin; it was laid with three-inch fir plank, and contained a light for the captain's cabin, also the mizzen-top-sail-sheet bitts, and six 24-pounder carronades.

The Knee of the Head was generally of oak; the pieces which composed it were of various forms and thicknesses, tabled and dowelled together: the after side was fayed and bolted to the stem of the ship, and its lower end continued downwards towards the gripe.

The Rudder was that useful machine attached to the stern-post by pintles and braces; it was formed of oak and fir timber, the principal of which was called the main-piece, which reached sufficiently above the upper-deck to allow a hole to be cut in it for the reception of the spare tiller in case the working tiller on the lower gun-deck should be rendered unserviceable in time of action, or by accident.

The Cheeks to the knee of the head were knee pieces of oak timber supporting the knee; their after arms were bolted to the bow of the ship, and their fore-arms to the knee of the head.

The Cat-heads were strong compass pieces of oak timber, whose outer ends projected from the ship's sides, and the inner ends were secured under the fore-castle beams: each of them had three sheaves at the outer end for the purpose of catting the anchor.

The Channels were an assemblage of planks fayed and dowelled together edgeways; the fore and main-channels were bolted to the side of the ship above the upper-deck ports, and the mizzen-channel above the quarter-deck ports, for the purpose of spreading the shrouds in order to support the masts.

The Figure-head was the principal piece of carved-work or ornament at the head of the ship ; it was scored over the knee of the head and bolted to the lace-piece.

The Bolsters to the Hawse were large pieces of oak or elm timber, fayed and bolted to the bows of the ship between the cheeks : there were two holes cut through each of them in the direction of the hawse-holes, the fore-sides of which were made with an easy round to prevent the cable from chafing.

The Timbers in the head were narrow pieces of oak, standing nearly perpendicular ; their lower ends were fayed and fastened on the upper cheek, and the upper ends bolted to the main-rail : the middle and lower head-rails being let into them and secured.

The Cross-pieces in the head were also pieces of oak let in and bolted to the main-rails ; they had knees at each end which secured the head-rails. Between the two main-rails the head was framed with carlings and ledges. There were also seats of ease in the head for the convenience of the seamen.

The Bumkins were pieces of round fir timber, bolted to the middle of the main-rail ; their inner ends were secured by cleats against the bows, and the outer ends projected from the rails for the purpose of hauling down the fore-tack.

The Rails of the Stern were of oak, fayed to the round-aft of the stern and to the round-up, and bolted to the timbers : they were distinguished thus ; the tuck-rail, which was the lowest ; the lower counter-rail, which was above the latter ; the upper counter-rail; the foot-rail, breast-rail, and also the cove. The stern was then planked up with two-inch rabbeted plank, which was fastened to the timbers.

The Taffrail was the upper part of the stern, and composed of light ornamental carved-work.

The munions of the Stern were broad pieces of fir about two inches thick; they were placed equidistant from each other, and fastened to the stern-timbers to receive the sashes.

The stools of the quarter-gallery were thick pieces of plank fayed together edgeways, and bolted to the sides of the ship. Of these there were three sorts—viz., the lower, middle, and upper stools, for building the quarter-gallery.

The Quarter-pieces were substantial pieces of fir timber, forming the boundaries of the stern and connecting the quarter-galleries thereto, and to the taffrail; their upper ends were bolted to the ship's sides, and the lower ends extended downwards to the middle stool, where they were secured by iron knees.

The Quarter-rails were of oak, and formed the boundaries of the quarter-galleries; the lower rails were termed the rails on the lower stools; the next the breast-rails, foot-rails, and the rails on the upper stools.

The Munions to the quarter-galleries were of fir about two inches thick; they were placed equidistant from each other, and fastened to the stools and rails to receive the sashes.

The Lower-finishings were solid pieces of ornamental carved-work, fastened to the ship's sides under the quarter-galleries.

The Upper-finishings were also ornamental carved-work, placed upon the upper stools and fastened at each with nails. The dead-eyes and chains were let into the channels, and secured thereto; the chain-plates were then let on, and the chain and preventer bolts driven and secured.

The Port-lids to the lower gun-deck were similar to shutters, hung by hinges, to enclose the ports in bad weather. These port-lids had scuttles cut through them for the admission of fresh air, and lids hung to them with illuminators in the centre, in order to give light between decks.

The False-keel was of elm, and was fastened in a temporary manner under the main-keel with nails and copper-staples made for that purpose, to prevent the keel from being chafed, should the vessel strike the ground, in which case the false gave way, and the main-keel was preserved.

In order to give a more comprehensive idea of the different timbers, the disposition of the frame of a second-rate ship is shown in Fig. 10, Plate 12, where

A is the main-keel.
B the stern-post.
C the stem.
D the knight-head.
E the knuckle-timber.
F the side counter-timber.
G the midship ditto.
H the wing-transom.
I the filling-transom.
J the deck-transom.
K the seven transoms under the deck-transom.
L the after fashion-piece.
M the middle ditto.
N the foremost ditto.
O O O the floor-timbers, which crossed the keel.

P P P the first futtock.
Q Q Q the second ditto.
R R R the third ditto.
S S S the fourth ditto.
T T T the top-timbers.
V V V the lengthening pieces to the fourth futtock.
U U the gun-deck port-sills.
W W the middle-deck ditto.
X X the upper-deck ditto.
Y Y the quarter-deck and forecastle ditto.
a a the round-house ports.
b b the quarter-deck and forecastle ditto.
c c the upper-deck ditto.
d d the middle-deck ditto.
e e the lower-deck ditto.
f the entering-port.
g g g the doorways to the quarter-gallery.
h h h h h the hawse-pieces.
i i the hawse-holes.
k k the double futtocks in the fore and after-bodies.

A C E B D F H K M O Q, the station of the square-timbers of the frame in the fore-body.

s u w y, etc., the station of the cant-timbers of the frame in the fore-body.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21, the station of the square-timbers of the frame in the after-body.

23, 25, 27, 29, and 31, the station of the cant-timbers of the frame in the after-body.

SHORES; props or stanchions fixed under a ship's side or bottom, to support her on the stocks, or when laid on the blocks in the slip.

SHROUDS; a range of large ropes extended from the mast-heads to the right and left sides of a ship, to support the masts and enable them to carry sail, etc.

The shrouds were always divided into pairs or doubles: that is to say, one piece of rope was doubled (Fig. 4, Plate 8), and the two parts fastened together at a small distance from the middle *a*, so as to leave a sort of noose or collar *a b* to fix upon the mast-head. This collar being fixed in its place—viz., close down upon the trestle-trees *k*, Fig. 9, Plate 6, a pair of shrouds hung from it, whose lower ends reached down to the deck: the lower ends of these shrouds were set up or extended to the channel I on the outside of the ship, by the application of mechanical powers, as explained in the articles dead-eye and lanyard.

The number of shrouds by which a mast was sustained, as well as the size of the rope of which they were formed, was always in proportion to the size of the mast, and the weight of sail it was intended to carry.

Bentinck Shrouds were strong ropes seized on the futtock-staves of the lower rigging, and extending to the opposite channels, where they were set up by means of dead-eyes and lanyards, in the same manner as the other shrouds; their use was to relieve or support the masts when the ship rolled heavily.

Bowsprit Shrouds were shrouds put over the head of the bowsprit, and extended on each side to the ship's bows to support the former.

Bumkin Shrouds were strong ropes fixed as stays or supports to the bumkin-ends, to prevent their rising by the efforts of the fore-tacks upon them.

Futtock, or Foothook Shrouds, were pieces of rope communicating with the futtock-plates above and the cat-harpings below, and forming ladders whereby the sailors climbed up to the top-brim (See Plate 15, No. 30.)

The Top-mast Shrouds were extended from the top-mast-heads to the edges of the tops, as shown in Fig. 1, Plate 6, and in Plate 8, Fig. 6. The lower dead-eye, as represented by *q*, Fig. 1, Plate 6, employed for this purpose, was fitted with an iron band, called foot-hook-plate, which passed through a hole in the edge of the top, and communicated with a rope called foot-hook shroud, whose lower end was attached to the shrouds of the lower-mast, in the station *l*. The upper ends of the foot-hook shrouds were furnished with an iron hook, as shown at *n*, Fig. 9, Plate 6, which entered a hole in the lower end of the foot-hook plate, so that when the top-mast shrouds were extended to secure the mast, the foot-hook shrouds necessarily acquired an equal tension by means of the foot-hook plate, which passing through the top, transmitted the effort of the mechanical powers to the foot-hook shrouds below.

The Top-gallant Shrouds, were extended to the cross-trees, as represented by *m*, Fig. 1, Plate 6, where passing through holes in their ends, they continued over the futtock-staves of the top-mast rigging, and, descending almost to the top, were set up by lanyards passing through thimbles instead of dead-eyes.

SILLS, of the ports, or Port-sills; pieces of oak timber let in horizontally between the frames to support the upper and lower sides of the ports.

SKIDS, or Skeeds; long compassing pieces of timber formed so as to answer the vertical curve of a ship's side. They were notched below so as to sit closely upon the wales; and as they were intended to preserve the planks of the side, when any weighty body was hoisted or lowered, they extended from the main-wales to the top of the side; and they were retained in this position by bolts, or spike-nails.

SKY-SCRAPER; a small triangular sail generally made of canvas, and sometimes set above the royal.

SLOOP; a small vessel furnished with one mast, the main-sail of which was attached to a gaff above, to the mast on its foremost edge, and to a boom below; by which it was occasionally shifted to either quarter. It differed from a cutter by having a fixed steering bowsprit and a jib-stay; nor were the sails generally so large in proportion to the size of the vessel. (See Plate 16.)

SPANKER; a name sometimes given to a ship's driver, which article see.

SPIRKETTING; the strake wrought on the ends of the beams; or where there were ports, it was the two strakes worked up to the port-sills. (See P, Fig. 1, Plate 3.)

SPRIT-SAIL; a sail attached to a yard which hung under the bowsprit, as represented by *y* in Fig. 1, Plate 16. It was furnished with a large hole at each of its lower corners, to evacuate the water with which the cavity or belly of it was frequently filled by the surge of the sea, when the ship pitched.

Sprit-Sail Topsail; a sail extended above the former by a yard which hung under the jib-boom. The lower corners of this sail were hauled home to the sprit-sail yard-arm; after which the sail was drawn out towards the extremity of the boom, in light winds, as any other top-sail-yard was hoisted upon its mast.

Formerly the sprit-sail top-sails were set on a mast, which was erected perpendicularly on the end of the bowsprit: but this method was rejected, as being inconvenient and dangerous to the bowsprit, although serviceable in light winds.

Sprit-Sail Top-gallant-sail was a quadrilateral sail cut square on the head, and set upon the flying-jib-boom, in the same manner that the sprit-sail top-sail was set upon the inner jib-boom: this sail was, however, very rarely used.

SPURS, of the Beams; carved pieces of timber, serving as half-beams to support the decks where the whole beam could not be placed on account of the hatchways. See the article Deck.

Spurs, of the Bitts; the same as Standards, which article see.

SQUARE-RIGGED; is a term used in contradistinction to all vessels whose sails extended by stays, lateen, or lug-sail yards; or by booms and gaffs; the usual situation of which is nearly in a plane with the keel.

SQUARE-STERNED; implied a stern like a British-built ship of war, in opposition to the Dutch and other northern nations, who built their ships with round sterns.

STAFF; a light pole erected in different parts of the ship, whereon to hoist and display the colours.

Ensign-Staff, a staff erected immediately over the stern of a ship to display the ensign. See the article Ensign.

Flag-Staff ; was that erected at each of the mastheads, or formed by their upper ends to support the flag or pendant of the respective squadron or division to which the ship belonged.

Jack-Staff ; was that fixed at the end of the bowsprit to extend the jack. See the article Jack.

For the lengths and diameters of the Staffs, see the article Yard.

STANCHION ; a sort of small pillar of wood or iron used for various purposes in a ship : as to support the deck, the quarter-rails, the netting, the awnings, etc.

Stanchions, also denoted the upright pieces of timber in a bulkhead, breast-work, etc., of a ship.

STANDARDS ; inverted knees placed above the deck instead of beneath it, and having their vertical branches pointed upwards from those which lay horizontally. Such also were the standards of the Bitts and Channels, which articles see.

STAY ; a large strong rope employed to support the mast on the fore part, by extending from its upper end towards the fore part of the ship, as the shrouds were extended to the right and left and behind it. See the articles Mast, Rigging, and Shroud.

Fore Stay was that which reached from the foremast head towards the bowsprit end.

Main Stay was that which extended over the forecastle to the ship's stem.

Mizzen Stay was that which stretched to a collar on the main-mast immediately above the quarter-deck.

Fore-topmast Stay was that which came to the end of the bowsprit, a little beyond the forestay.

Main-topmast Stay was attached to the head or hounds of the foremast.

Mizzen-topmast Stay was that which came to the hounds of the mainmast.

Fore Top-gallant Stay was that which came to the outer end of the jib-boom.

Main Top-gallant Stay was that which was extended to the head of the fore-topmast.

Royal Stays were those which extended to the jib-boom end, or to the heads of the top or top-gallant masts next before them. The whole of these stays were nearly in the directions of the upper edges of the several stay-sails which derived their names from them. See the article Sail.

Spring Stays were a kind of assistant stays extending in a direction nearly parallel to the principal stays ; they were much thinner than the others, and only used to the lower-masts and top-masts.

Stay-holes were the holes made through stay-sails at certain distances along the top, through which they were seized to the hanks of the stay.

Stay-sails were triangular sails extended upon a stay. See the article Sail.

Stay-sail Stays were ropes used solely to extend and support the stay-sails, as the middle stay-sails.

STEELER ; the foremost or aftmost plank in a strake, which was dropped short of the stem or stern-post.

STEM ; a circular piece of timber, into which the two sides of a ship were united at the fore end ; the lower end of it was scarphed to the keel, and the bowsprit rested upon its upper end. See Plate 7, Figs. 1 and 2, and Plate 4, in all of which the stem is represented by C.

The stem was formed of one or two pieces, according to the size of the vessel ; and as it terminated the ship forward, the ends of the wales and plank of the sides and bottom were let into a groove or channel, in the middle of its surface, from the top to the bottom ; which operation was called rabbeting.

The outside of the stem was usually marked with a scale of feet, according to its perpendicular height from the keel, by which means the draught of water at the fore part could be ascertained.

The stem at its lower end was equal in breadth and thickness to the keel, but it grew proportionately broader and thicker at its upper extremity. See the articles Naval Architecture and Shipbuilding.

False Stem was that fixed before the right one. It was fitted when a ship's stem was so flat that she could not keep the wind well.

STEMSON ; an arched piece of timber fixed within the apron to reinforce the scarph thereof, in the same manner as the apron supported the scarph of the stem. In large ships it was usually formed of two pieces, as represented by I, Fig. 1, Plate 7.

STEP, of the Capstan ; a large block of oak let down between, and bolted to the beams of the lower gun-deck, as represented by A, Fig. 6, Plate 2 ; it had a hole in its upper side, to receive the spindle of the capstan which worked therein.

Steps of the Main and Fore-masts, were large pieces of oak crossing the kelson, as appears in Plate 6, Figs. 1 and 9 ; that of the main-mast was fixed only, but that of the foremast was bolted securely, and they received the heels of these masts.

Step of the Mizzen-mast was also a large piece of oak, bolted to the beams of the lower gun-deck, to receive the heel of that mast.

Steps of the Sides, were moulded pieces of beech or oak timber, nailed to the sides of the ship, as represented by c, Fig. 2, Plate 7, for the convenience of getting on board.

STERN; the posterior face of a ship; or that part which would be presented to the view of a spectator, placed on the continuation of the keel behind, as exhibited in Plate 13, Figs. 1 and 2; and in Plates 11 and 14.

The stern, as represented in these Plates, was terminated above by the taffrail, and below by the counters: it was limited on the sides by the quarter-pieces, and the intermediate space comprehended the galleries and windows of the different cabins.

Explanation of Plate 11, which exhibits the Stern of a 74-gun ship.

B, the stern-post.

C, the rail which determined the height of the counters.

D D, the upper and lower quarter-galleries, with their balustrades and windows.

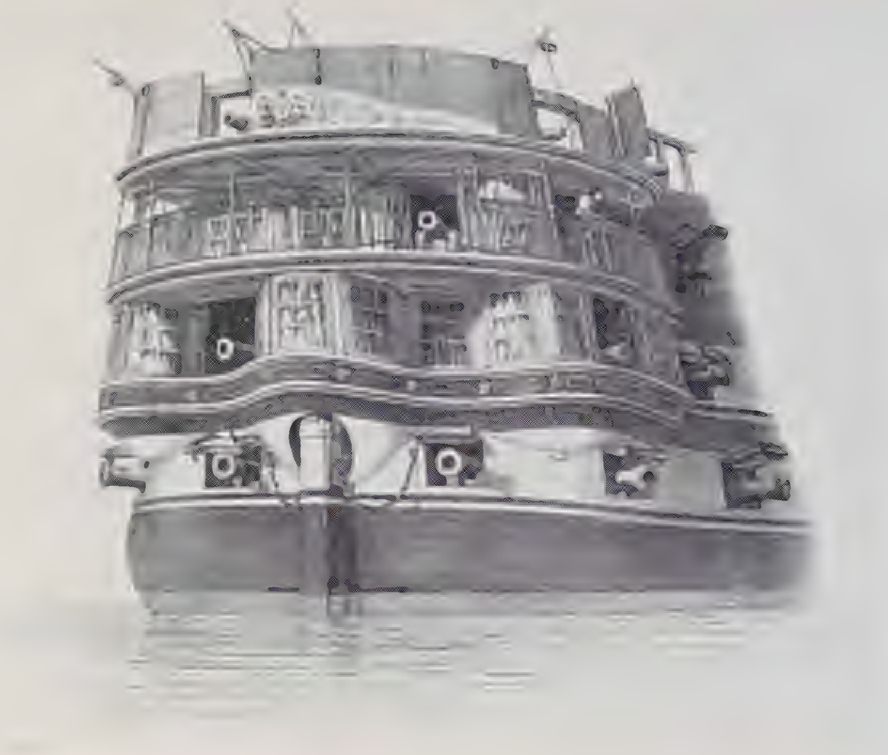
E, the quarter-pieces: and P F P, the taffrail.

K G K, the lower counter, with H H, its gun-ports.

G, the rail which separated the lower counter from the second or upper counter; which last is included between G and C.

K K, the wing-transom.

L L, the deck-transom.



E. W. Cooke, 1828.

THE CIRCULAR STERN OF H.M.S. "ASIA," 84 GUNS.

One of the Ships in the Engagement at Navarino.

M, N, O, first, second and third transoms.

O M L K P, the direction of the fashion-piece, whose upper part is expressed by the dotted lines K P.

Q, the cove, a sort of arched canopy, serving as a roof to the stern-gallery.

R Q R, the screen bulk-head, or partition, containing the cabin windows.

R S S R, the balustrade of the stern-gallery, with S S, the foot-pace-rail, which determined the height of its floor, or platform.

S C S, the ward-room windows.

T, the lower finishing of the quarter-gallery.

Plate 14, represents the stern of a first or second rate: accordingly it is furnished with a middle compartment between the ward-room and the captain's cabin. This compartment is also furnished with galleries on the stern and quarter.

N.B.—This article and Plates 11 and 14 referred to in it, are taken from the first edition (1769) of Falconer's Dictionary.

STERN-FRAME; that frame of timber which was composed of the stern-post-transoms and fashion-pieces.

STERN-POST; a long straight piece of timber erected on the extremity of the keel, to sustain the rudder and terminate the ship behind.

This piece, which is expressed by B in the pieces of the hull, Fig. 1, Plate 7, was well secured and supported; because the ends of all the lower planks of the ship's bottom were fixed in a channel cut on its surface, and the whole weight of the rudder was sustained by it.

The dimensions of the stern-post, or the proportional breadth and thickness, in the different parts of its height, are geometrically delineated in the quarter of a 74-gun ship referred to from the article Stern. It was usually marked like the stem, with a scale of feet from the keel upwards, in order to ascertain the draught of water aft.

The stern-post was strongly attached to the keel by a knee, G, in the pieces of the hull, Fig. 1, Plate 7, of which one-branch extended along the keel, being scarphed and bolted to the dead-wood, and clinched under the main-keel; whilst the other branch inclined upwards, and corresponded with the inside, or fore part of the stern-post, to which it was also bolted in the same manner.

STIRRUPS; short ropes having their upper ends plaited and nailed round the yards, and eyes made in their lower ends, through which the horses were rove, to keep them parallel to the yards. See the article Horse.

STOOLS; small channels fixed to the ship's sides, to contain the dead-eyes for the back-stays. See the article Back-stay Stool.

Stools were also pieces of plank fastened to the ship's side to receive the berthing of the gallery.

STRING; the highest range of planks in a ship's ceiling; or that which lay between the gun-wale and the upper edge of the gun-ports, as expressed by T, in the midship-section, Fig. 1, Plate 3.

STUDDING-SAILS; certain light sails extended, in moderate and steady breezes, beyond the skirts of the principal sails, where they appeared as wings to the yard-arm. (See Plate 8, Fig. 6.)

Lower Studding-sails were spread beyond the leeches of the main and fore-sails, and fixed nearly in the same manner; only that the booms which extended the feet were generally hooked to the chains by means of a goose-neck; or else swung off with the sail, to which they were suspended; being kept steady aft by means of a guy.

Top-mast and Top-gallant Studding-sails, were those which were set on the outside of the top-sails and top-gallant-sails: they were spread at the foot by booms, which, sliding out from the extremities of the main and fore-yards, their upper edges were attached to small yards, which were hoisted up to the top-sail and top-gallant yard-arms. See the articles Saddle and Boom-iron.

Studding-sail Booms were long poles sliding through boom-irons at the extremities of the yards, and from the vessel's sides, used to spread the studding-sails. See also the article Boom.

SWIFTERS; two shrouds fixed on the starboard and port sides of the lower masts, above all the other shrouds, as an additional security to the masts, and were never confined like them, to the cat-harpings.

T

TABLING, of the Sails; the act of making broad hems on the skirts and bottoms of a ship's sails, to strengthen them in that part which was attached to the bolt-rope.

TACK; a rope used to confine the foremost lower corners of the courses and stay-sails in a fixed position, when the wind crossed the ship's course obliquely. The same name was also given to the rope employed to pull out the lower corner of a studding-sail or driver to the extremity of its boom.

The main-sail and fore-sail of a ship were furnished with a tack on each side, which was formed of a thick rope tapering to its end, and having a knot formed upon its largest end, by which it was firmly retained in the clew of the sail: the tack, therefore, extended the sail to windward, whilst the sheet extended it to leeward. See the article Chess-tree.

Tack of a Sail, was the name given, by analogy, to that part of any sail to which the tack was fastened.

TAFFRAIL; the curved-work at the upper part of a ship's stern, as expressed by F, in Plate 11, and usually ornamented with sculpture.

TENON; in carpentry, the end of a mast, bowsprit, or any other piece of timber, cut smaller to enter into a mortise.

TERM; a piece of carved-work, placed under each end of the taffrail, at the side timber of the stern, and extended down as low as the foot-rail of the balcony. The term is represented by E, in Fig. 1, Plate 5.

THICK-STUFF; a term given to all plank exceeding four inches in thickness. See the articles Midship-section and Shipbuilding.

THROAT; a name given to the end of a gaff which was next the mast, and opposed to the peak, which implied the outer extremity. Hence the ropes employed to hoist up, and lower, the gaff, being applied to those parts of it, were called the throat and peak halyards.

Throat-brails were those which were attached to the gaff close to the mast. See the article Brails.

Throat of a Knee, implied the hollow part of a piece of knee-timber.

TILLER; a piece of timber fitted into the head of the rudder, with which to steer the ship. See the article Helm.

TIMBERS of a Ship; the ribs, or incurvated pieces of wood, branching outwards from the keel in a vertical direction, so as to give strength, figure, and solidity to the whole fabric.

It has been observed in the article Naval Architecture, that one timber was composed of several pieces united into one frame, which was accordingly called a frame of timbers by the artificers. These different pieces are exhibited in Fig. 1, Plate 7. The head of the lower piece, or floor-timber, was cut square to join the heel of the next above it. To support the connection of the timber in that place, another assemblage of pieces was formed, and joined in the same manner; so that when both the sets were fastened together, the joinings in one set were nearly opposite to the middle of the pieces in the other. Hence it is evident that the mould which served for the lowest piece conformed to the under part of the corresponding piece above it: and thus the mould, appropriated to every division of a timber, determined or answered to the figure of the next adjoining it.

The timbers whose areas or planes were perpendicular to the keel were called square-timbers; and those which were placed obliquely on the keel, as at the extremities of a ship, were called cant-timbers. The foremost of those timbers on the ship's bow were called knuckle-timbers; and the hindmost on the quarter were called the fashion-pieces.

The outlines, or bends, of the principal timbers of the ship, are geometrically delineated in the plane of projection, Plate 7, and their principal stations in the ship's length are represented in the horizontal plane, and that of the elevation, Plate 7. In order to give a more comprehensive idea of their figures and dimensions, we have exhibited a perspective view of the carcase of a small vessel, in Plate 13, Fig. 3, consisting only of the keel A, the stern-post B, and the stem C, the transoms K L M, and the ribbands F F. (*N.B.*—This figure and its description is taken from the first edition, 1769, of Falconer's Dictionary.)

Filling-timbers were those which were put up between the frames.

Floor-timbers. See the article Floor.

Top-timbers were the uppermost timbers, or the first general tier of timbers that reached the top of the side: those which scarphed on the heads of the futtocks were called short top-timbers.

TIMENOGUY; a rope fastened at one end to the fore shrouds, and nailed at the other to the anchor-stock, on the bow, to prevent the fore-sheet from entangling.

TOP; a sort of platform surrounding the lower-mast-head, from which it projected on all sides like a scaffold.

The principal intention of the top was, to extend the top-mast shrouds, so as to form a greater angle with the mast, and thereby give additional support to the latter. It was sustained by certain timbers fixed across the hounds or cheeks of the mast, and called the trestle-trees and cross-trees, the former of which are expressed by *k k*, Fig. 5, Plate 6, and the latter by *l l*, Fig. 9, Plate 6.

The plan of the top was generally made in two parts for the convenience of getting it into its place, and it is represented by Fig. 4, Plate 6, where *a a* represent the two span-pieces, which were bolted through the top to keep its parts together : *b b*, the cross-trees upon the trestle-trees, which were also bolted through the top to secure it in its place ; *c c*, the knees ; and *d d*, the rim.

The top was extremely convenient to contain the materials necessary for extending the small sails, and for fixing or repairing the rigging with more facility and expedition. In ships of war it was used as a kind of redoubt, and was accordingly fortified for attack or defence, being furnished with swivels, musketry, and other fire-arms, and guarded with a thick fence of corded hammocks.

The frame of the top was either close-planked like a platform, or open like a grating. The former kind was generally stronger and more convenient ; but the latter was much better in tempestuous weather, as presenting a smaller surface to the wind when the ship heeled over, and by consequence being less exposed to its efforts.

The dimensions for the tops in the Royal Navy in 1815 were as follow :

The breadth of the top athwartships, was one-third the length of its corresponding top-mast ; the length fore and aft, three-fourths the breadth. The size of the square hole was, athwartships, two-fifths the breadth of the top; fore and aft, thirteen-fourteenths the breadth; and its after side was one-fifth the length of the top from the aft-side of the platform; and it was placed in the middle athwartships. The trestle-trees and cross-trees extended nearly to the edge of the top. See these articles.

TOP-SAILS; large sails extended across the top-masts, by the top-sail-yards above, and by the yards beneath; being fastened to the former by earings and rope-bands, and to the latter by top-sail-sheets, which passed through two great blocks on its extremities; and from thence to two other blocks fixed on the inner part of the yard close by the mast, and lead downwards to the deck, where they might be slackened or extended at will.

Top-gallant Sails were extended above the top-sail-yards, in the same manner as the top-sails were extended above the lower yards. See the article Sail.

TOPPING-LIFT; a large strong tackle, used to suspend or top the outer end of a gaff, or the boom of a cutter's, brig's, sloop's, or schooner's main-sail.

TRAIL-BOARD; the carved-work between the cheeks, that was fastened to the knee of the head.

TRANSOMS; certain beams or timbers of oak fixed across the stern-post of a ship, and bolted thereto to fortify her afterpart, and give it the figure most suitable for the service for which she was intended.

The deck-transom was the aftmost beam of the lower-deck, on which all the deck planks were rabetted: and all the transoms were fixed athwart the stern-post in the same manner as the floor-timbers were laid upon the keel. As the floor-timbers also, with regard to their general form and arrangement, had a rising, by which the bottom became narrower as it ascended towards the extremities ; so the arms of the transoms, being gradually closer in proportion to their distance from the wing-transom downwards, gave a similar figure to that part of the ship, which accordingly became extremely narrow, from the counter towards the keel.

Although these pieces were therefore extremely different in their figures, according to the extent of the angles formed by their branches or horns, each of them had nevertheless a double curve, which was partly vertical and partly horizontal, with regard to its situation in the ship.

The vertical direction of the arms or angles of the transoms, with regard to the ship's length, are expressed in the plane of elevation, Plate 7 ; and their horizontal curves are also delineated on the plane of projection in the same plate, and described in the general explanation of the planes in the article Naval Architecture.

As the transoms filled up the whole space comprehended between the head of the stern-post above, and the aftmost floor-timbers below, it was necessary to distinguish them by particular names.

Helm Port Transom, that which was at the head of the stern-post, and formed the upper part of the gun-room ports.

Wing-transom, the next below, which formed the lower part.

Deck-transom, that on which all the lower-deck planks were rabetted.

Below the deck-transom, the transoms were distinguished by numbers from the top downwards.

TRAVELLER; a large iron thimble whose diameter was much larger, in proportion to the breadth of its surface, than the common ones, as represented by Fig. 18, Plate 3. It was furnished with a tail formed of a piece of rope about three feet in length, the end of which encircled the ring, to which it was spliced. These machines were principally intended to facilitate the hoisting or lowering of the top-gallant yards at sea, for which purpose two of them were fixed on each back-stay, on which they slid up or down like the ring of a curtain upon its rod.

Jib-traveller was a circular iron hoop, with a hook and shackle, used to haul out the tack of the jib.

TREE-NAILS; long cylindrical pins of cleft oak, from an inch to an inch and a half in diameter, and from one foot to three feet six inches in length, used to fasten the inside and outside plank of a ship to the upright timbers.

The tree-nails were justly esteemed superior to spike-nails or bolts, which were liable to rust and loosen, as well as to rot the timber. They were well dried before use, so as to fill their holes when they were swelled with moisture. They had usually one inch in thickness to a hundred in the vessel's length; so that the tree-nails of a ship of a hundred feet long, were one inch in diameter; and one inch and a half for a ship of a hundred and fifty feet.

TRESTLE-TREES; two strong bars of oak timber fixed horizontally on the opposite sides of the lower-mast-head, to support the frame of the top, and the weight of the top-mast. See the articles Mast and Top.

TRUCKS of the Mast-heads; circular pieces of wood fixed as a cap on the top-gallant mast-head; they were generally fixed with two or more small pulleys, through which the pendant and signal halyards were rove.

Trucks of the Shrouds, were short cylindrical pieces of elm, etc., having a hole through the middle, lengthways, a groove down the side, the same size as the shrouds, and a score round the middle to admit a seizing: they were seized to the shrouds, to lead ropes through, that they might more readily be found.

Trucks of the Flag-staffs, were flat and round pieces of elm, having a small sheave on each side: they were fixed by a small mortise-hole cut in the middle, upon the upper end of flag-staffs, and were used to reeve the halyards.

TRUSS; a machine employed to pull the yard home to its respective mast, and retain it firmly in its position. See the article Parral.

As the truss was generally used instead of a parral, it was rarely employed, except in flying top-gallant sails, which were never furnished with parrals. It was simply a ring or traveller, which encircled the mast, and had a rope fastened to its after part, leading downwards to the top or decks; by means of which the truss could be straightened or slackened at pleasure. The halyards of the top-gallant sails being passed through this ring, and the sail being hoisted up to its utmost extent, it is evident that the yard would be drawn close to the mast, by pulling down the truss close to the upper part of the sail; for without the truss, the sail and its yard would have been blown from the mast; unless the yard were hoisted close up to the pulley through which the halyards ran; which was seldom the case in flying top-gallant sails, because they were usually much shallower than those which were fixed or standing.

Truss also implied short pieces of carved-work, mostly in small ships, fitted under the taffrail, in the same manner as the terms, which article see.

TRY-SAIL; a small sail used by cutters, luggers, sloops, etc., in lieu of their main-sails, during a storm.

TUCK; that part of a ship where the ends of the bottom planks were collected together, immediately under the stern or counter.

When this part, instead of being incurvated, and forming a convex surface, assumed the shape of a vertical or oblique plane, it was said to be square.

A square tuck was terminated above by the wing-transom, and below and on each side by the fashion-pieces.

TUMBLING-HOME; that part of a ship's side which fell inwards above the extreme breadth, so as to make the ship gradually narrower from the lower-deck upwards. This angle is represented in general throughout all the timbers in the plane of projection, Plate 7. It is also more particularly expressed by Q T, in the midship-section, Plate 3, Fig. 1, where it is evident, that the ship grew narrower from Q towards T.

TYE; a sort of runner or thick rope, used to transmit the effort of a tackle to any yard or gaff, which extended the upper part of a sail.

The tye was either passed through a block fixed to the mast-head, and afterwards through another block attached to the yard or gaff, and turned to the mast-head; or the end of it was simply passed over the sheave in the mast-head, and then fastened to the said yard or gaff.

V

VANE; a slip of bunting placed at the mast-head or some other conspicuous place in the ship, as represented by *b*, Fig. 6, Plate 1. It was commonly sewn upon a wooden frame called the stock, which contained two holes whereby to slip it over the spindle, upon which it veered about by the wind, thus showing its direction.

VANGS; a sort of braces to support and keep steady the mizzen-gaff; they were fixed on the outer end or peak, and reached downwards to the aftermost part of the ship's quarters, where they were hooked and drawn taut, so as to be slackened when the wind was fair; and drawn in to windward when it became unfavourable to the ship's course.

W

WAIST; that part of a ship which was contained between the quarter-deck and forecastle being usually a hollow space, with an ascent of several steps to either of those places.

WALES; an assemblage of strong planks, extending along a ship's side, throughout her whole length at different heights, and serving to reinforce the decks.

As the wales were formed of plank broader and thicker than the rest, they resembled ranges of hoops encircling the sides and bows. They were usually distinguished into the main-wale and the channel-wale; the breadth and thickness of which are expressed by Q and R in the midship-section, Fig. 1, Plate 3, and their length is exhibited in the elevation, Plate 7, where Q R are the upper and lower edges of the main-wale, and S T, the upper and lower edges of the channel-wale, parallel to the former.

The situation of the wales, being fixed by no invariable rule, was generally left to the fancy and judgement of her builder; but the positions of the gun-ports and scuppers were particularly considered, that the wales might not be wounded by too many breaches.

WATER-LINES; certain horizontal lines supposed to be drawn about the outside of a ship's bottom close to the surface of the water on which she floated. They were accordingly higher or lower upon the bottom, in proportion to the depth of the column of water required to float her.

In order to conceive a clearer idea of the curves of those lines when represented on a plane, let us suppose a ship laid upright on a level ground; so that the keel lies in the same position, with respect to the horizon, as when she is laden. We may then describe several black horizontal lines about her bottom, which may be whitened for that purpose.

If a spectator were placed at a competent depth, upon the middle of her bottom, in a line perpendicular to the plane of the ground; he would then, viewing the bottom upwards, discover the horizontal curves of all the water-lines. These curves were all delineated on a plane, supposed to be formed by an horizontal section of the bottom, at the height of the load water-line.

WATER-SAIL ; a small sail spread occasionally under the lower studding-sail or driver-boom, in fair weather.

WATERWAYS ; long pieces of timber serving to connect the sides of a ship to her decks, and forming a channel to carry off the water from the latter by means of scuppers. See Plate 4, where the waterways are represented by *c a a d*.

The convexity of the decks, represented by N M N, in the midship-section, Plate 3, necessarily carried the water towards the sides, where this piece was fixed. The waterways, N N, were therefore hollowed in the middle lengthways, so as to form a kind of gutter or channel, one side of which lay almost horizontal, making part of the deck, whilst the other rose upwards, and corresponded with the side, of which it likewise made a part. The water-ways were scored down about an inch and a half, or two inches, upon the beams, and rested upon lodging-knees or carlings. They were secured by bolts driven from without through the planks, timbers, and water-ways, and clinched upon rings on the inside of the latter.

The scuppers, which were holes by which the water escaped from the deck, were accordingly cut through the water-ways.

WHEEL of the Helm ; see the article Helm.

WINDLASS ; a machine used in merchant ships instead of a capstan, to heave up the anchors from the bottom, etc.

It was a large piece of timber of an octagonal shape, as represented by Fig. 15, Plate 3, formed on the principles of the axis *in peritrochio*, and was supported at the ends by two frames of wood, *a*, *b*, placed on the opposite sides of the deck near the foremast, called windlass-bitts; it was turned about in this position as upon an axis, by levers, called handspikes, which were for this purpose thrust into square holes, cut through the body of the machine.

The lower part of the windlass was usually about nine inches above the deck. It was like the capstan, furnished with strong pawls, *c*, *d*, to prevent it from turning backwards by the effort of the cable, when charged with the weight of the anchor, or strained by the violent jerking of the ship in a tempestuous sea. The pawls which were formed of wood or iron, fell into notches, cut in the surface of the windlass, and lined with plates of iron. Each of the pawls, being accordingly hung over a particular part of the windlass, fell eight times into the notches at every revolution of the machine, because there were eight notches placed on its circumference under the pawls. So if the windlass was twenty inches in diameter, and purchased five feet of the cable at every revolution, it would be prevented from turning back, or losing any part thereof, at every seven inches nearly, which was heaved in upon its surface.

WOODLOCK; a piece of thick-stuff fitted on the rudder to prevent it from unshipping.

X.

XEBEC; a small three-masted vessel, navigated in the Mediterranean Sea, also on the coasts of Spain, Portugal, and Barbary, and was distinguished from all other European vessels by the great projection of the prow and stern beyond the cut-water and stern-post respectively. See Fig. 4, Plate 16.

The sails of the xebec were in general similar to those of the polacre, but the hull was extremely different.

Being generally equipped as a corsair, it was constructed with a narrow floor, to be more swift in pursuit of the enemy; and of a great breadth, to enable her to carry a considerable force of sail for this purpose, without danger of overturning. As these vessels were usually very low built, their decks were formed with a great convexity from the middle of their breadth towards the sides, in order to carry off the water, which fell aboard, more readily by their scuppers. But as this convexity rendered it very difficult to walk thereon at sea, particularly when the vessel rolled heavily, there was a platform of grating extending along the deck from the sides of the vessel towards the middle, and the water could pass through the grating to the scuppers.

When a xebec was equipped for war, she was sometimes navigated by three different methods, according to the force or direction of the wind.

Thus, when the wind was fair, and nearly astern, it was usual to extend square sails upon the main-mast; and, indeed, frequently upon the foremast: and as those sails were rarely used in a scant wind, they were of an extraordinary breadth.

When the wind was unfavourable to the course, and yet continued moderate, the square yards and sails were removed from the masts, and laid by, in order to make way for the large lateen sails and yards, which soon after assumed their place: but if the foul wind increased to a storm, these latter were also lowered and displaced; and small lateen yards with proportional sails were extended on all masts.

The xebecs, which were generally armed as vessels of war by the Algerines, mounted from sixteen to twenty-four cannon, and carried from 300 to 450 men, two-thirds of whom were generally soldiers.

The method of working these vessels was so exceedingly complicated and difficult, that the labour was very considerable.

Y

YACHT; a vessel of state, usually employed to convey princes, ambassadors, or other great personages, from one kingdom to another. (See Plate 16.)

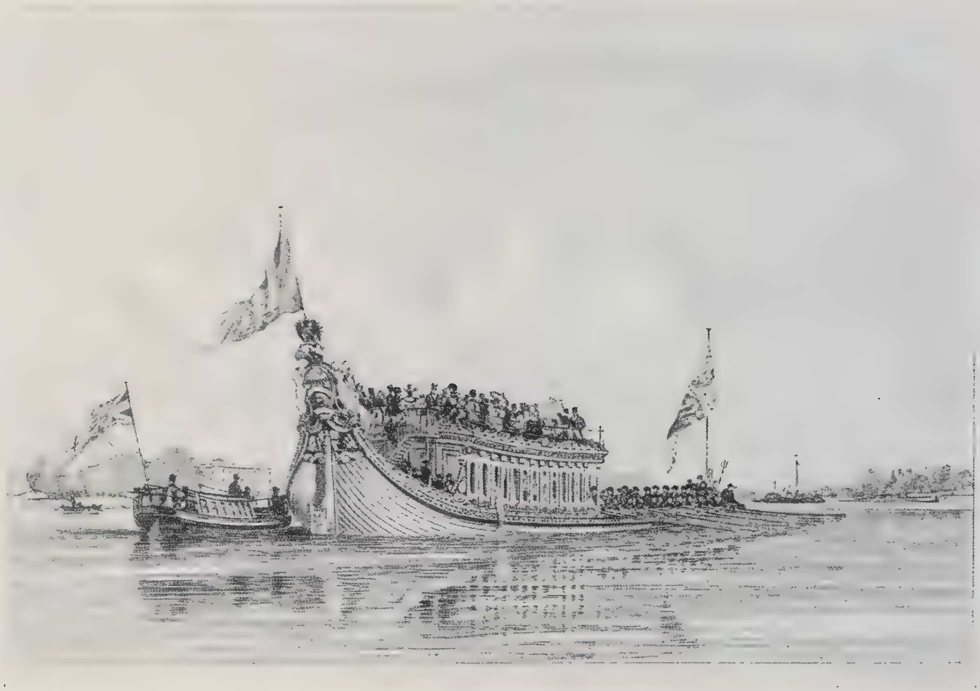
As the principal design of a yacht was to accommodate the passengers, it was usually fitted with a variety of convenient compartments, with suitable furniture.

The royal yachts were commonly rigged as ketches, except the principal one reserved for the sovereign which was equipped and rigged as a ship. They were elegantly furnished, and richly ornamented with sculpture; and always commanded by post-captains.

The smaller yachts, which were rigged as sloops, were generally used by the commissioners of the Navy, at the different dock-yards.

Private pleasure vessels, when sufficiently large for a sea voyage, were also termed yachts.

YARD; a long piece of timber suspended upon the masts of a ship, to extend the sails to the wind. See the articles Mast, Sail, Block, etc.



E. W. Cooke, 1838.

THE STATIONER'S BARGE.

All yards were either square or lateen; the former of which were suspended across the mast at right angles, and the latter obliquely.

The square-yards, Plate 8, Fig. 6, were nearly cylindrical in shape, tapering from the middle, which was called the slings, towards the extremities, which were termed the yard-arms; and the distance between the slings and the yard-arms on each side was divided by the artificers into quarters, which were distinguished into the first, second, and third quarters, and yard-arms. The middle quarters were formed into eight squares, and each of the end parts was figured like the frustrum of a cone. All the yards of a ship were eight square in the middle.

Cross-jack and Sprit-sail-yards were equal to the Fore-topsail-yard.

Sprit-topsail-yard was equal to the Fore-topgallant-yard.

The lifts of the main-yard are exhibited in Plate 8, Fig. 6, by *g g*; the horses and their stirrups by *h h, i i*; and the braces and brace-pendants by *t u*.

The mizzen-yard of a ship, the main-yard of a bilander, and the yards of a lugger, though they had not strictly speaking, lateen sails, were nevertheless hung obliquely on the mast, and the slings were nearer the fore end than the after end or peak.

The yards of a 74-gun ship are represented in Plate 8, Fig. 6, where *d d* is the main-yard, *e e* the main-topsail-yard, *f f* the main-topgallant-yard, and *k k* the main-royal-yard.

For the different names and positions of all the yards see the article Ship of War, and the figure of the first-rate ship referred to from that article.

Proportions for the Lengths and Diameters of Yards, Gaffs and Staffs in the Royal Navy.

LENGTHS OF YARDS.

Main-yard, eight-ninths of the main-mast.

Fore-yard, seven-eighths of the main-yard.

Mizzen-yard, six-sevenths of the main-yard.

Main-topsail-yard, five-sevenths of the main-yard.

Fore-topsail-yard, seven-eighths of the main-topsail-yard.

Mizzen-topsail-yard, two-thirds of the main-topsail-yard.

Topgallant-yard of 74-gun ships, two-thirds; all under, three-fifths of their topsail-yards.

Royal-yards, one-half of the topsail-yards.

Cross-jack-yard, the same as the fore-topsail-yard.

Spritsail-topsail-yard, the same as the fore-topgallant-yard.

Studdingsail-yards, four-sevenths of their booms.

Driver-yard, the same as the fore-topgallant-yard.

DIAMETERS OF YARDS.

Main and Fore-yards, at the slings, seven-tenths of an inch to every yard in length.

Mizzen-yard, two-thirds of the diameter of the main-yard.

Topsail-yards, five-eighths of an inch to every yard in the length.

Topgallant-yards, six-tenths of an inch to every yard in the length.

Royal-yards, one-half the diameter of their topsail-yards.

Spritsail-yard, the same diameter as the fore-topsail-yard.

Spritsail-topsail-yard, the same diameter as the fore-topgallant-yard.

Studdingsail-yards, one inch in diameter to every five feet in length.

Cross-jack-yard, the same diameter as the fore-topsail-yard.

Driver-yard, the same diameter as the fore-topgallant-yard.

LENGTH AND DIAMETER OF GAFFS.

Length of the Gaffs, five-eighths of their respective booms.

Diameter of the Gaffs, the same as their booms.

LENGTHS AND DIAMETERS OF STAFFS.

Length of the Ensign-staff, one-third of the main-mast above the taffrail.

Length of the Jack-staff, one-half the length of the ensign-staff above the taffrail.

Diameter of the Ensign-staff, half an inch to every yard in the length.

Diameter of the Jack-staff, three-fourths of an inch to every yard in the length.

N.B.—For the lengths and diameters of Booms, see that article.

The following Tables contain the length and diameters of all the yards now (1815) used in the Royal Navy in the different classes of ships and vessels, from a brig of 200 tons burden, to a first-rate of 110 guns.

Table of the Dimensions of Yards now used in the Royal Navy.

	110 Guns. 2,164 Tons.			90 Guns. 1,870 Tons.			80 Guns. 1,620 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-yard	102	4	24	98	0	22½	93	0	22
Main-topsail-yard	73	0	15½	70	0	14¾	66	6	14⅛
Main-topgallant-yard	48	9	10	46	6	9⅜	46	0	9¼
Main-royal-yard	32	0	7¾	30	0	7⅜	28	0	7
Fore-yard	89	1	21	85	9	20	81	4	19⅜
Fore-topsail-yard	64	6	13¾	61	0	12⅞	58	0	12¼
Fore-topgallant-yard	43	0	8⅝	40	6	8¼	40	0	8¼
Fore-royal-yard	27	0	6⅞	25	0	6⅜	24	0	6⅛
Mizzen-yard	87	0	16	84	0	15	76	0	14½
Mizzen-gaff	—	—	—	—	—	—	—	—	—
Mizzen-topsail-yard	49	0	10⅛	47	0	9¾	43	0	8⅞
Mizzen-topgallant-yard	32	9	6½	31	0	6¼	29	0	5¾
Mizzen-royal-yard	24	0	5	23	0	4⅞	21	0	4⅜
Spritsail-yard	64	6	13¾	61	0	12½	58	0	12¼
Spritsail-topsail-yard	43	0	8⅝	40	6	8¼	40	0	8¼
Driver-yard	—	—	—	—	—	—	—	—	—
Cross-jack-yard	64	6	13¾	61	0	12⅞	58	0	12¼
Lower-studdingsail-yard	33	0	6¾	31	0	6¼	29	6	6
Main-topmast ditto	29	6	6	28	0	3¾	26	6	5¼
Main-topgallant ditto	21	0	4¼	20	0	4	19	0	3¾
Fore-topmast ditto	25	6	5⅛	24	6	5	23	4	4¾
Fore-topgallant ditto	18	6	3¾	17	6	3½	16	6	3¼

	74 Guns. 1,800 Tons.			64 Guns. 1,369 Tons.			50 Guns. 1,044 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-yard	99	0	23	90	4	21	82	0	19¼
Main-topsail-yard	72	0	15	66	0	13⅝	60	9	12½
Main-topgallant-yard	46	6	9½	39	0	7⅞	36	0	7⅜
Main-royal-yard	28	0	7½	27	0	6¾	26	0	6¼
Fore-yard	85	0	20	79	6	18½	72	0	17
Fore-topsail-yard	63	0	13	57	6	12⅛	52	6	11
Fore-topgallant-yard	40	6	8¼	34	6	7	31	6	6¼
Fore-royal-yard	25	0	6½	23	0	6	23	0	5½
Mizzen-yard	84	0	15½	77	0	14	—	—	—
Mizzen-gaff	—	—	—	—	—	—	44	0	11½
Mizzen-topsail-yard	47	0	9¾	43	3	9	39	6	8¼
Mizzen-topgallant-yard	31	6	6⅜	29	0	5¾	26	0	5¼
Mizzen-royal-yard	23	0	4⅞	21	0	4½	19	0	4⅛
Spritsail-yard	62	0	13	57	6	12⅛	52	6	11
Spritsail-topsail-yard	40	6	8¼	34	6	7	31	6	6¼
Driver-yard	—	—	—	—	—	—	31	6	6¼
Cross-jack-yard	62	0	13	57	6	12⅛	52	6	11
Lower-studdingsail-yard	31	0	6¼	29	0	5¾	26	0	5¼
Main-topmast ditto	27	3	5½	25	9	5⅛	23	6	4¾
Main-topgallant ditto	20	0	4	18	9	3¾	17	6	3½
Fore-topmast ditto	24	6	5	22	9	4½	20	6	4⅛
Fore-topgallant ditto	17	9	3½	16	6	3¼	15	0	3

	44 Guns. 879 Tons.			38 Guns. 951 Tons.			36 Guns. 871 Tons.		
	Length Ft.	In.	Dia. Ins.	Length Ft.	In.	Dia. Ins.	Length Ft.	Ins.	Dia. Ins.
Main-yard	80	0	18½	81	9	19	79	0	18⅝
Main-topsail-yard	57	6	11⅞	59	0	12¼	57	0	12
Main-topgallant-yard	36	0	7⅜	37	0	7½	34	9	7
Main-royal-yard	25	0	5⅞	25	0	6⅛	25	0	6
Fore-yard	70	0	16¼	71	6	16⅜	69	4	16
Fore-topsail-yard	52	0	10¾	53	0	11½	51	9	11
Fore-topgallant-yard	32	0	6⅜	32	9	6½	31	6	6⅜
Fore-royal-yard	23	0	5⅜	23	0	5¾	23	0	5½
Mizzen-gaff	36	8	11	38	0	11½	36	0	11
Mizzen-topsail-yard	39	6	8	40	0	8¼	39	4	7⅞
Mizzen-topgallant-yard	25	9	5⅛	27	9	5½	27	0	5½
Mizzen-royal-yard	19	0	4	20	0	4⅛	19	0	3⅞
Spritsail-yard	52	0	10	53	0	11½	51	9	11
Spritsail-topsail-yard	32	0	6⅜	32	9	6½	31	6	6⅜
Driver-yard	32	0	6⅜	32	9	6½	31	6	6⅜
Cross-jack-yard	52	0	10¾	53	0	11½	51	9	11
Lower-studdingsail-yard	25	6	5⅛	26	0	5¼	25	6	5⅛
Main-topmast ditto	23	0	4¾	23	6	4¾	22	6	4½
Main-topgallant ditto	16	6	3¼	17	0	3½	16	6	3¼
Fore-topmast ditto	20	0	4	20	6	4⅛	20	0	4
Fore-topgallant ditto	15	0	3	15	0	3	15	0	3

	32 Guns. 677 Tons.			28 Guns. 594 Tons.			24 Guns. 513 Tons.		
	Length Ft.	In.	Dia. Ins.	Length Ft.	In.	Dia. Ins.	Length Ft.	In.	Dia. Ins.
Main-yard	74	4	17⅛	71	3	16½	65	6	15
Main-topsail-yard	75	0	11⅜	52	0	11	47	0	9⅜
Main-topgallant-yard	33	6	6⅝	32	6	6½	29	6	6
Main-royal-yard	25	0	5⅝	25	0	5½	23	6	4⅞
Fore-yard	65	0	15	62	2	14½	57	8	13¼
Fore-topsail-yard	48	0	10	46	0	9¾	41	0	8⅝
Fore-topgallant-yard	29	6	5⅞	28	6	5⅝	25	10	5⅜
Fore-royal-yard	23	0	5	23	0	4⅞	20	6	4⅜
Mizzen-gaff	35	0	10	32	6	9¾	29	4	8⅝
Mizzen-topsail-yard	36	9	7	35	0	7¼	31	5	6½
Mizzen-topgallant-yard	24	0	5	22	0	4⅜	19	6	4
Mizzen-royal-yard	18	0	3½	17	6	3⅝	15	8	3¼
Spritsail-yard	48	0	10	46	0	9¾	41	0	8⅝
Spritsail-topsail-yard	29	6	5⅞	28	6	5⅝	25	10	5⅜
Driver-yard	29	6	5⅞	28	6	5⅝	25	10	5⅜
Cross-jack-yard	48	0	10	46	0	9¾	41	0	8⅝
Lower-studdingsail-yard	23	6	4¾	23	0	4⅝	21	0	4¼
Main-topsail ditto	21	3	4¼	20	6	4	19	0	3⅞
Main-topgallant ditto	16	0	3¼	15	0	3	13	6	2¾
Fore-topmast ditto	18	6	3¾	17	9	3½	16	6	3¼
Fore-topgallant ditto	14	0	2⅞	13	3	2⅝	11	9	2⅜

	20 Guns. 429 Tons.			Sloops of 300 Tons.			Brigs of 200 Tons.		
	Length		Dia.	Length		Dia.	Length		Dia.
	Ft.	In.	Ins.	Ft.	In.	Ins.	Ft.	In.	Ins.
Main-yard	63	0	14½	55	0	12¾	42	0	9¾
Main-topsail-yard	45	6	9½	39	6	8¼	31	6	7
Main-topgallant-yard ..	28	4	5¾	25	0	5	23	6	5
Main-royal-yard	20	0	4¾	17	0	4⅛	15	9	3½
Fore-yard	55	0	12⅝	48	5	11¼	42	0	9¾
Fore-topsail-yard	40	0	8½	35	0	7⅜	31	6	7
Fore-topgallant-yard ..	25	0	5	22	0	4⅜	23	6	5
Fore-royal-yard	18	0	4¼	16	0	3¾	15	9	3½
Mizzen-gaff	28	6	8½	24	9	7⅜	—	—	—
Main-gaff	—	—	—	—	—	—	28	0	7¼
Mizzen-topsail-yard.. ..	31	0	6¼	26	4	5½	—	—	—
Mizzen-topgallant-yard ..	19	6	4	16	6	3¼	—	—	—
Mizzen-royal-yard	15	6	3⅛	13	2	2¾	—	—	—
Spritsail-yard	40	0	8½	35	0	7⅜	31	6	7
Spritsail-topsail-yard ..	25	0	5	22	0	4⅜	23	6	5
Driver-yard	25	0	5	22	0	4⅜	—	—	—
Cross-jack-yard	40	0	8½	35	0	7⅜	—	—	—
Lower-studdingsail-yard ..	20	0	4	17	6	3½	13	6	2¾
Main-topmast ditto ..	18	6	3¾	15	6	3⅛	12	0	2½
Main-topgallant ditto ..	13	0	2⅝	11	6	2¼	8	9	2¼
Fore-topmast ditto ..	15	9	3⅛	14	0	2⅞	12	0	2½
Fore-topgallant ditto ..	11	6	2¼	10	0	2	8	9	2¼

Sprit-sail Yard; a name given to the yard which was placed immediately under the bowsprit: it was the same length as the fore-topsail-yard, and is represented by *y*, Fig. 1, Plate 16.

Sprit-sail-topsail Yard; the yard which was sometimes placed under the jib-boom, and was the same length as the fore-top-gallant-yard.

THE END.

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ANCHORS, BLOCKS, DEAD-EYE, HEA

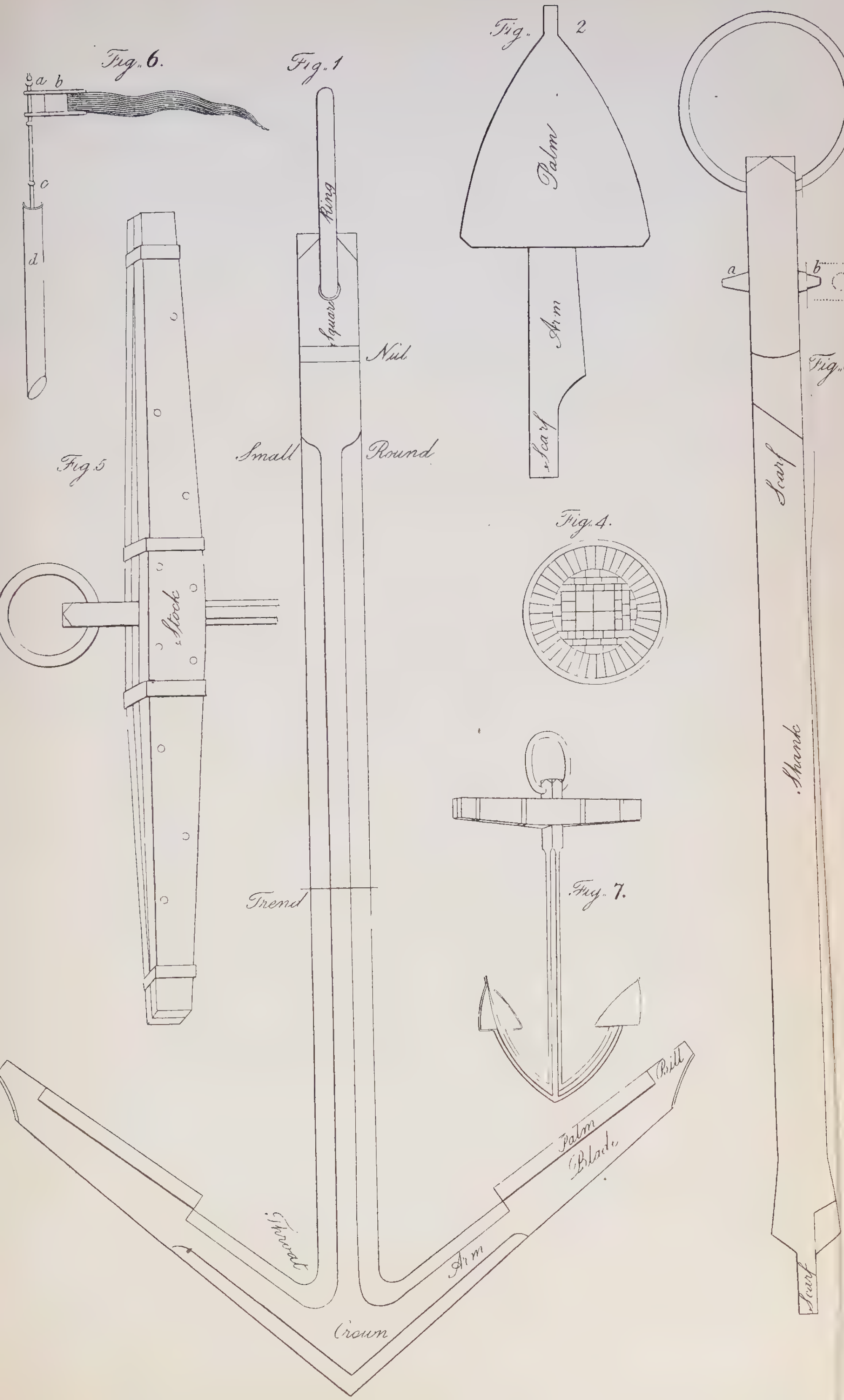
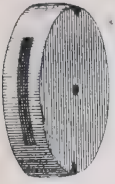


Fig. 6.
a
b
c
d
Fig. 1
Ring
Square
Nut
Small
Round
Trend
Throat
Crown
Arm
Palm
Blade
Bill
Fig. 2
Palm
Arm
Scarf
Fig. 3.
a
b
m
Scarf
Shank
Scarf
Fig. 4.
Fig. 5
Stock
Fig. 7.

RT, EUPHROE, VANE, etc. Plate I.

Fig. 8.



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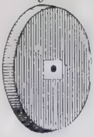

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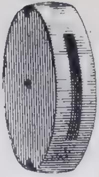

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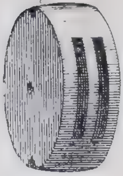

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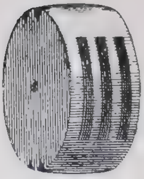

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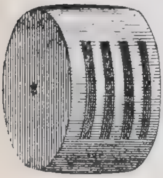

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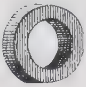

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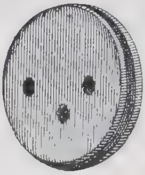

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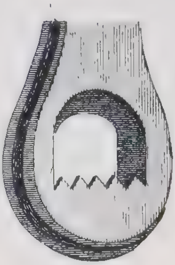
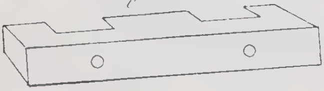


Fig. 17



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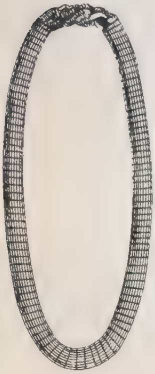

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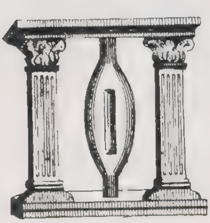

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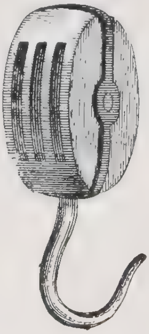

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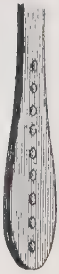

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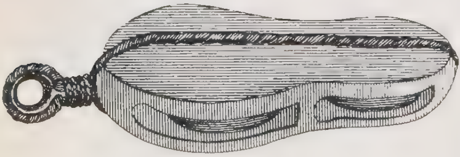

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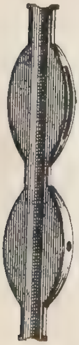

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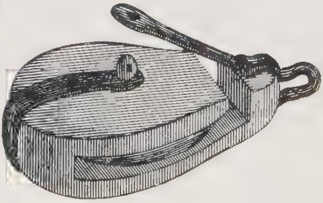

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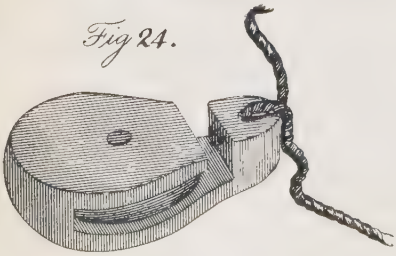

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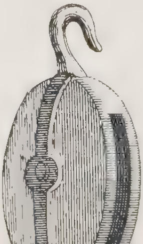


Fig. 28.

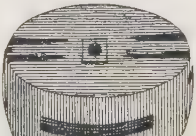
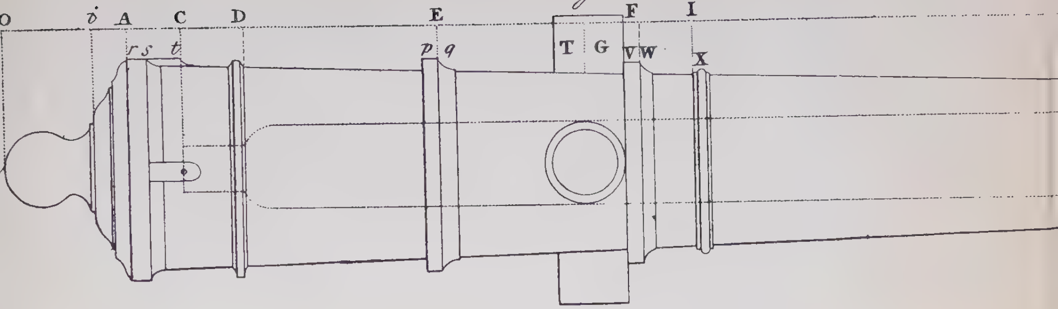


Fig. 27.

Fig. 26.

CANNON, CARRONADE, CAPSTA

Fig. 1.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Plan of the Carriage of a 32 Pounde

Fig. 3.

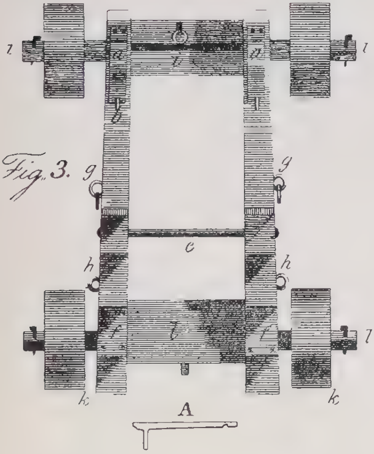
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Fig. 4.

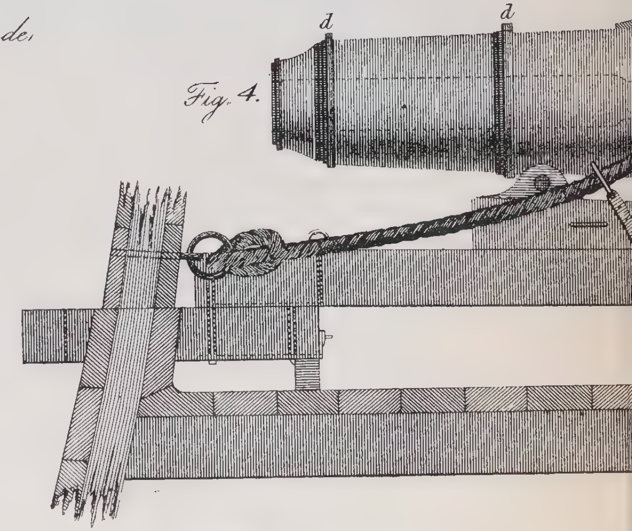

Fig. 6.

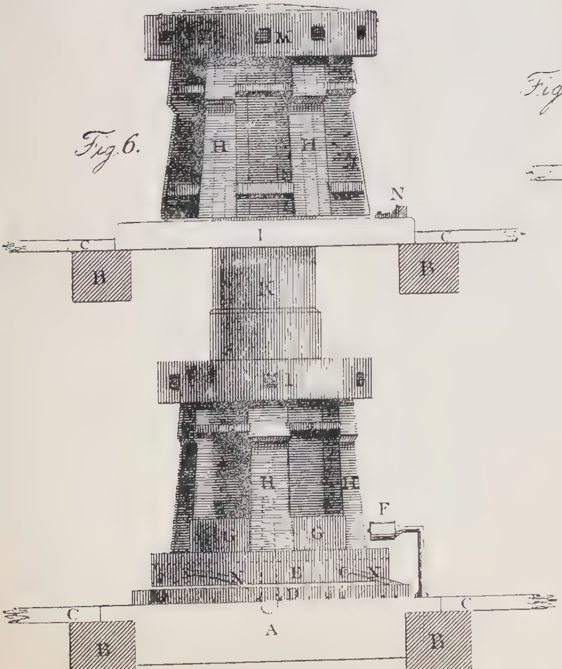
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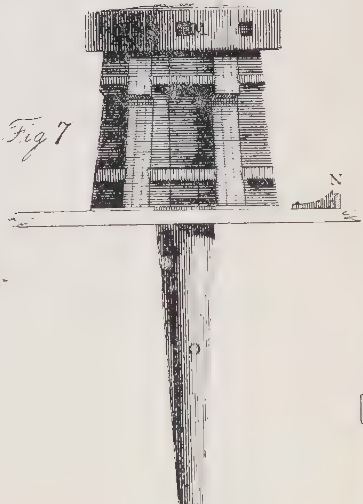
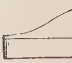
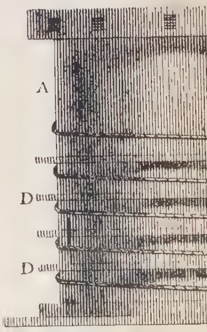
Fig 7







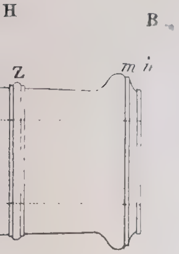
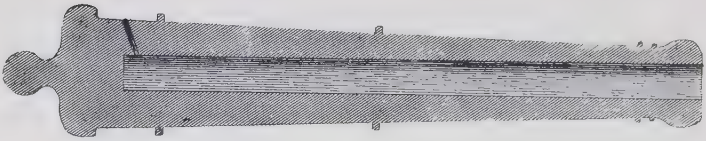
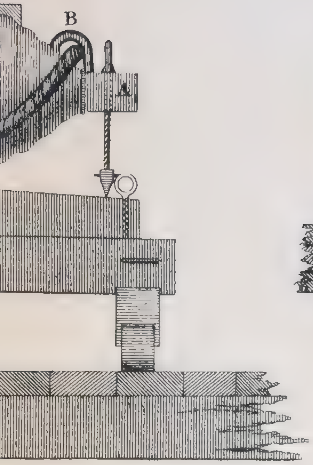


Fig. 2

Longitudinal Section of a 32 Pounder.





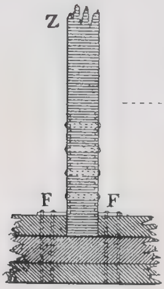


Fig. 5.

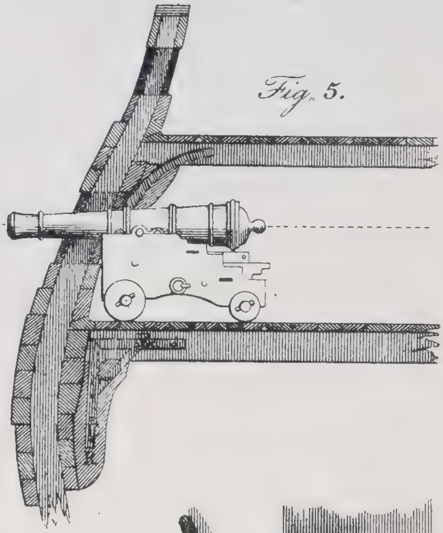


Fig. 10

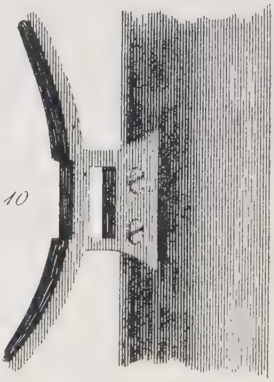


Fig. 8.

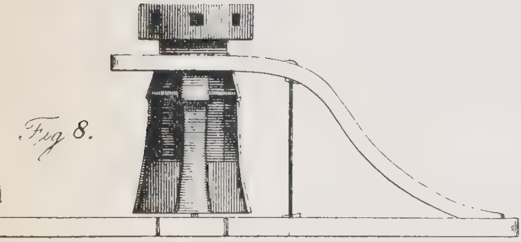


Fig. 9.

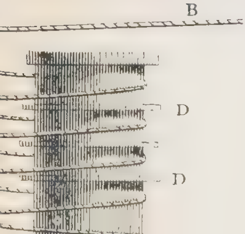


Fig. 11.

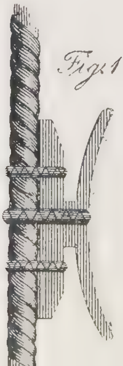


Fig. 12.

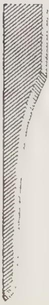


Fig. 13

Fig. 14.

MIDSHIP-SECTION, CANNON, DAVIT, CLEAT
CROW-FOOT, CRINGLE, BOLT

g. 5.

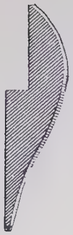


Fig. 6.

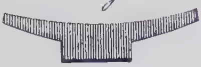


Fig. 2.

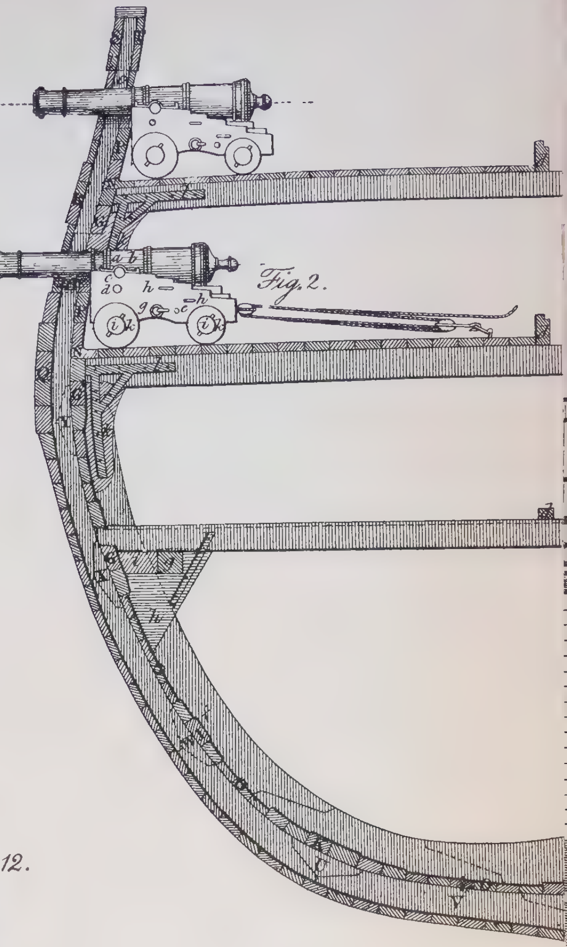

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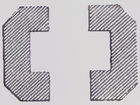
Fig. 7.



ig 8.

Fig. 9.

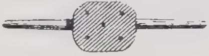


Fig 10.

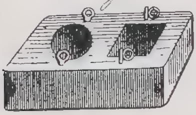


Fig. 11.

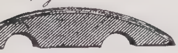


Fig. 12.

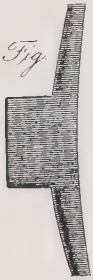


Fig 13.

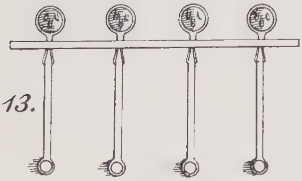


Fig 15

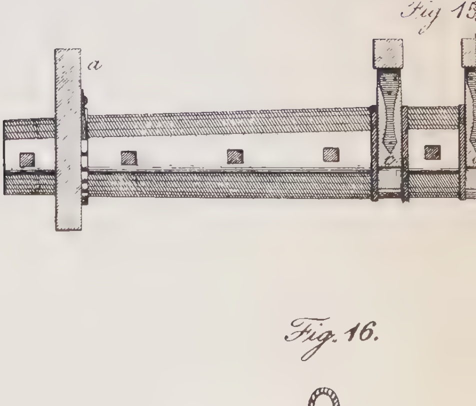


Fig. 14.

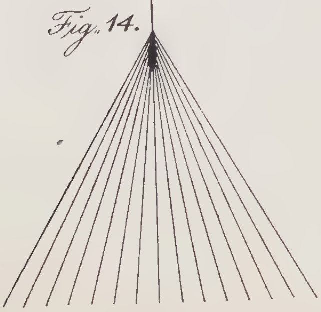
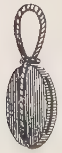


Fig. 16.



S, WINDLASS, DEAD-EYES, CRAB, CAP, -ROPE, CAT-HEAD, etc.

Plate III.

Fig. 1

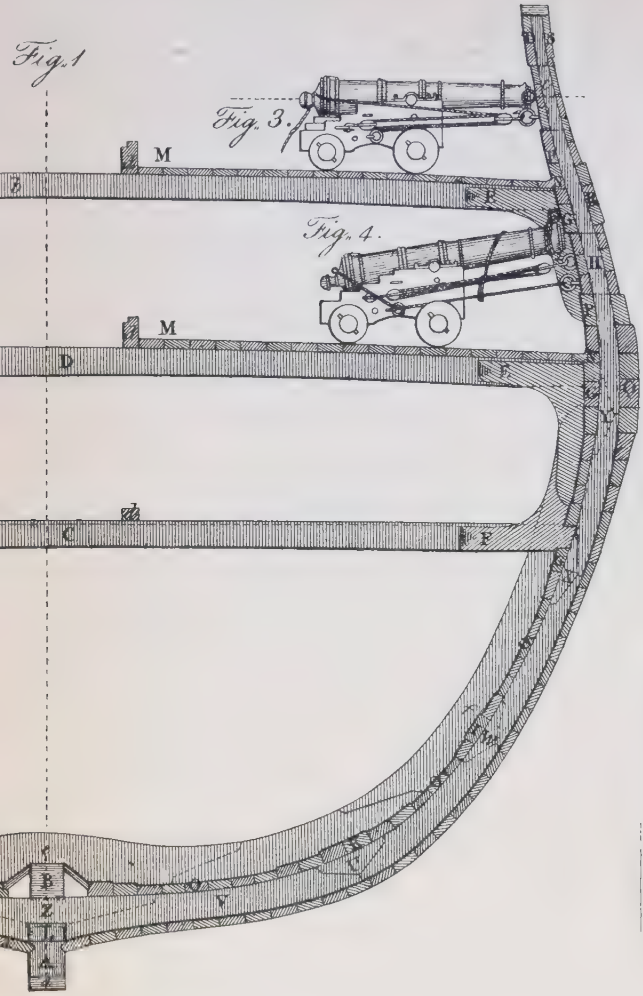


Fig. 3.
Fig. 4.
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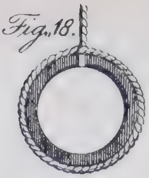
Fig. 18.



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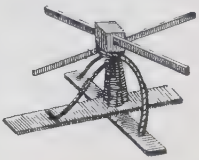

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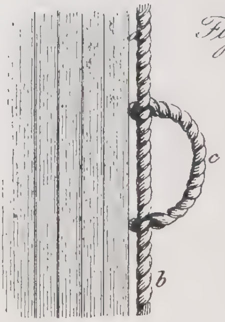


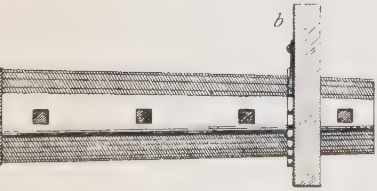
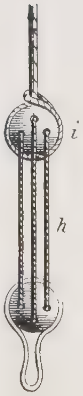


Fig. 21.



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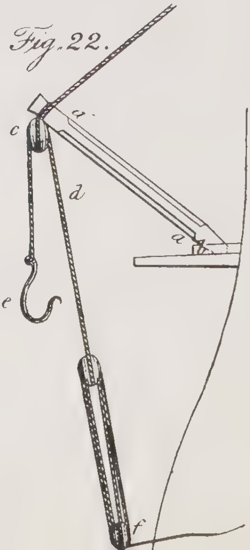
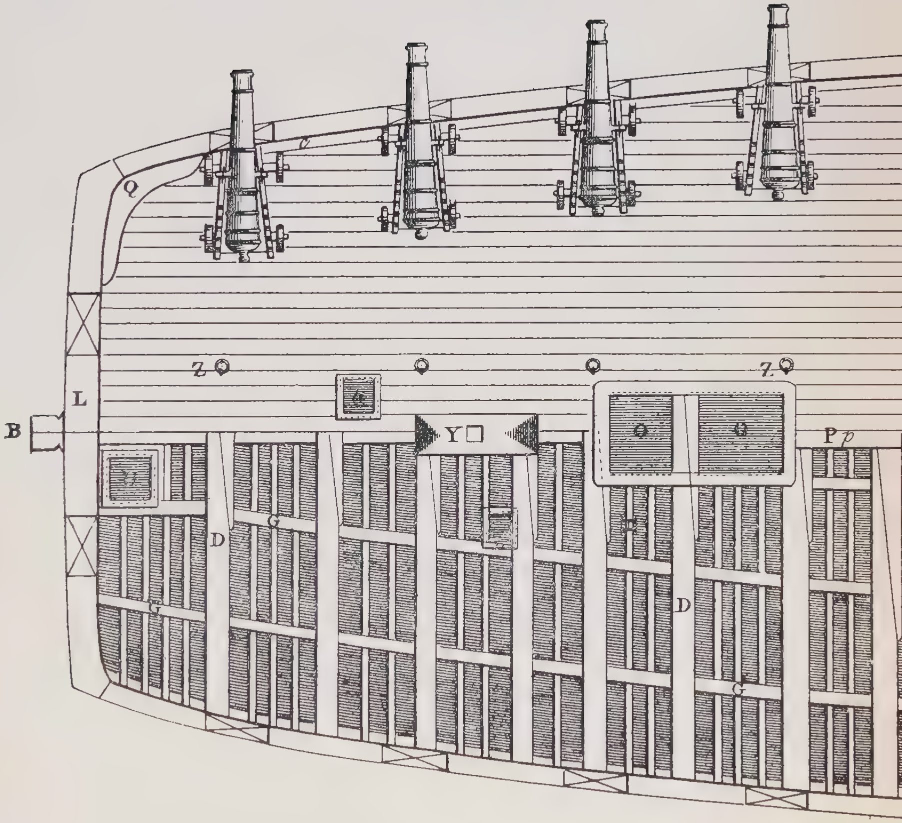


Fig. 17.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G

LOWER-DECK OF A 74-GUN SHIP.

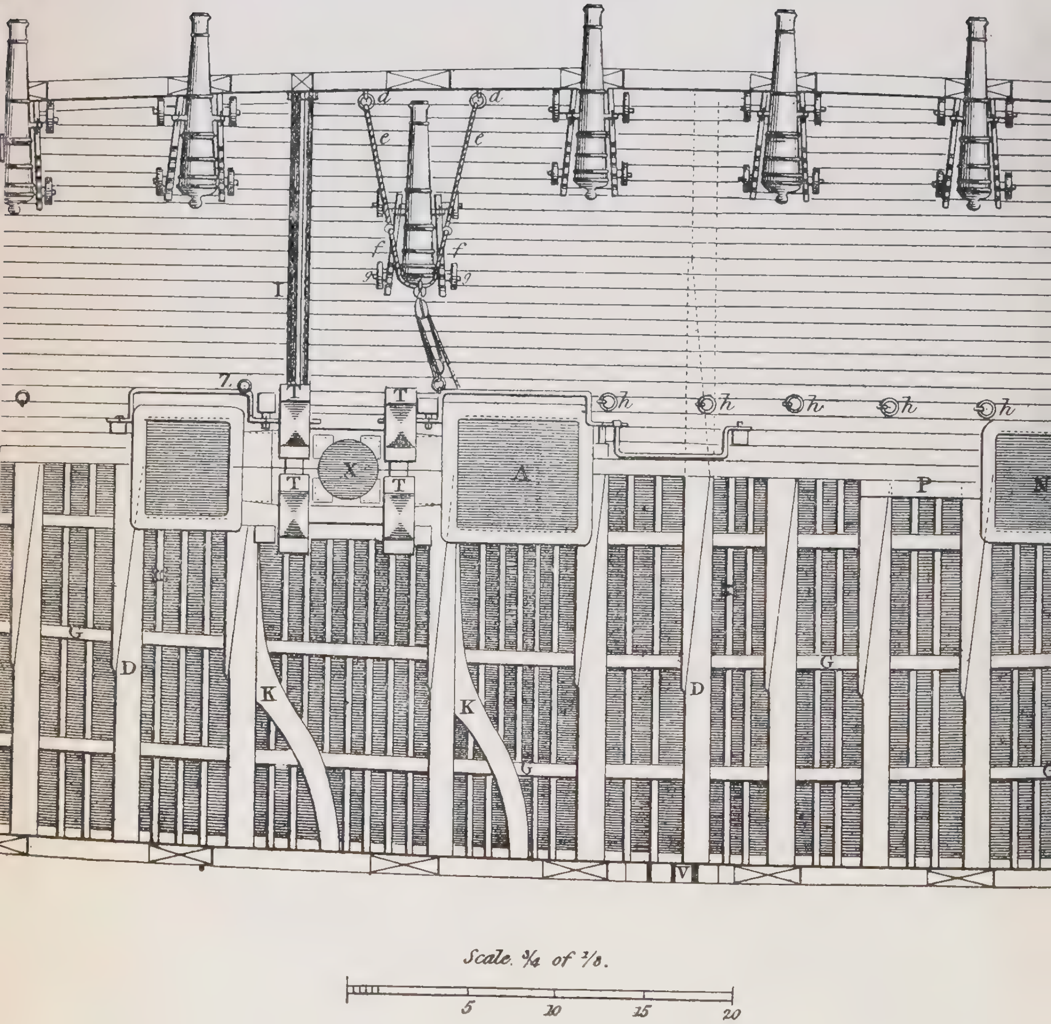
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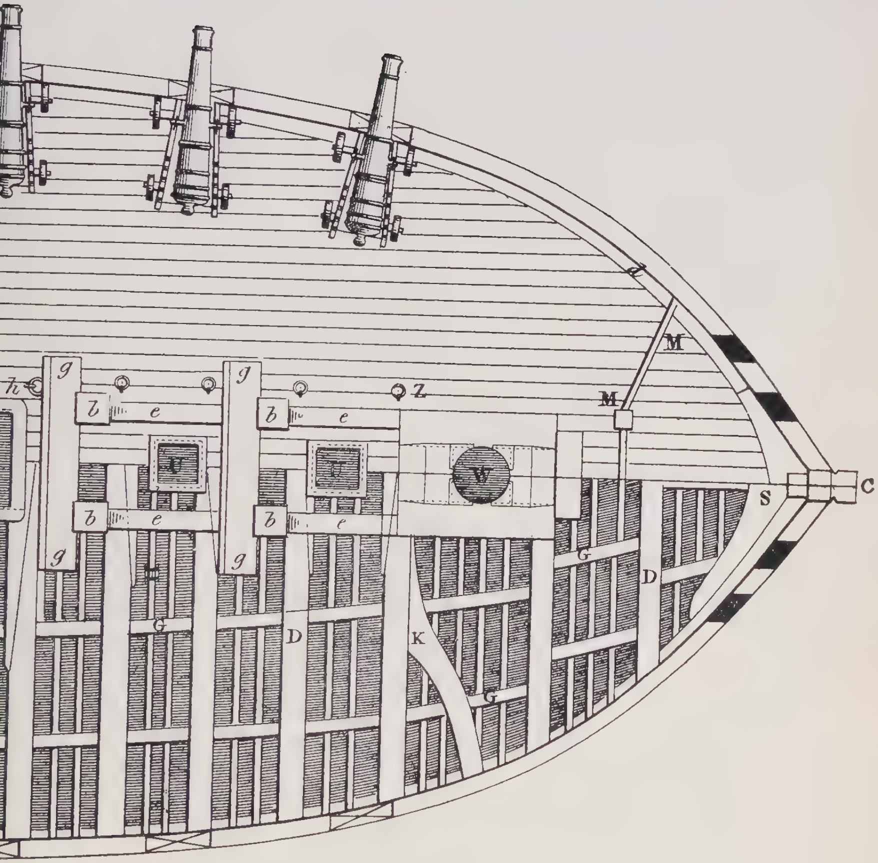
Plate IV.



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T

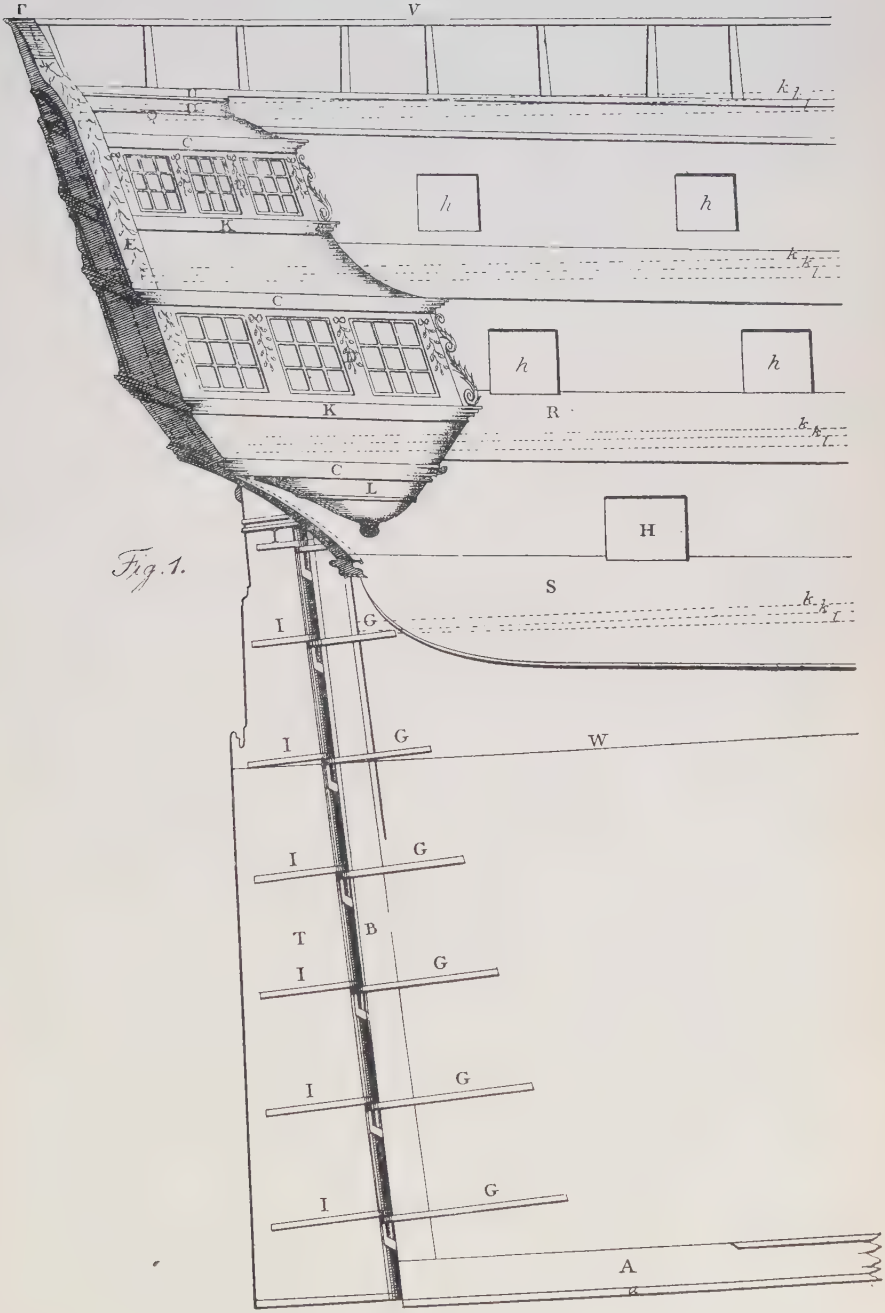

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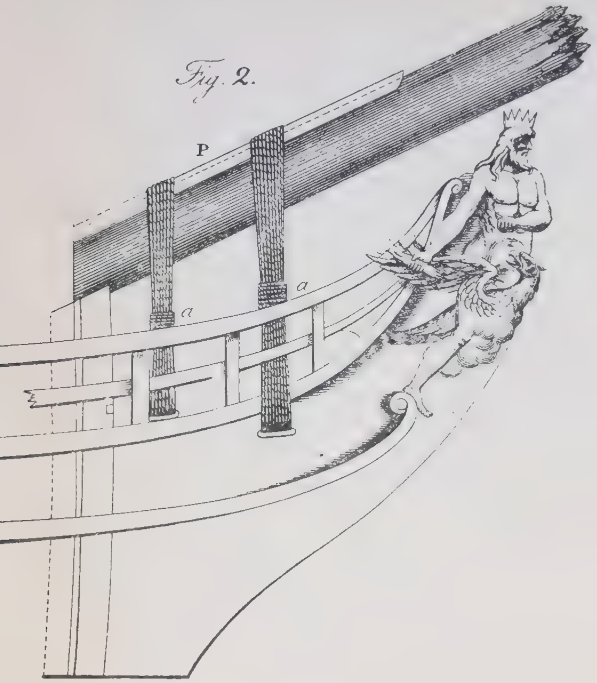
Fig. 1.

OF FIGURE-HEADS, HEAD AND STERN OF A 74-GUN SH

Fig. 2.



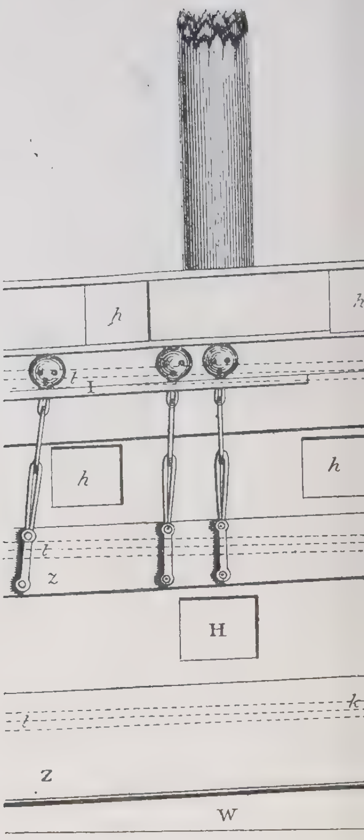

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Fig. 3.

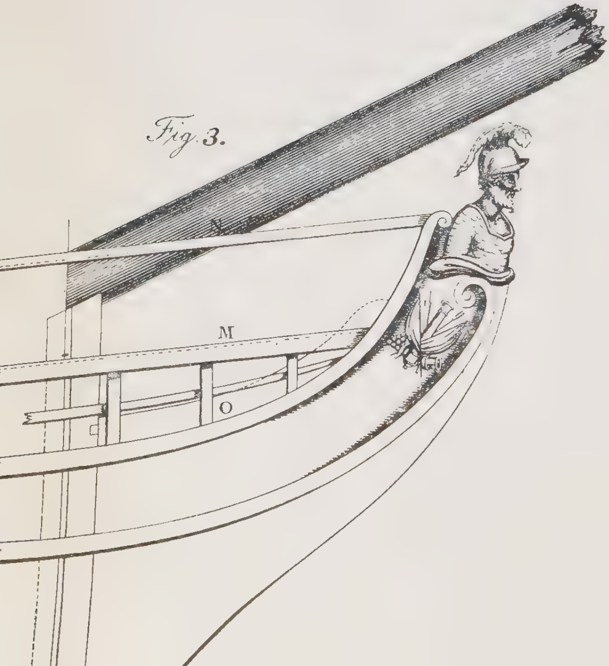
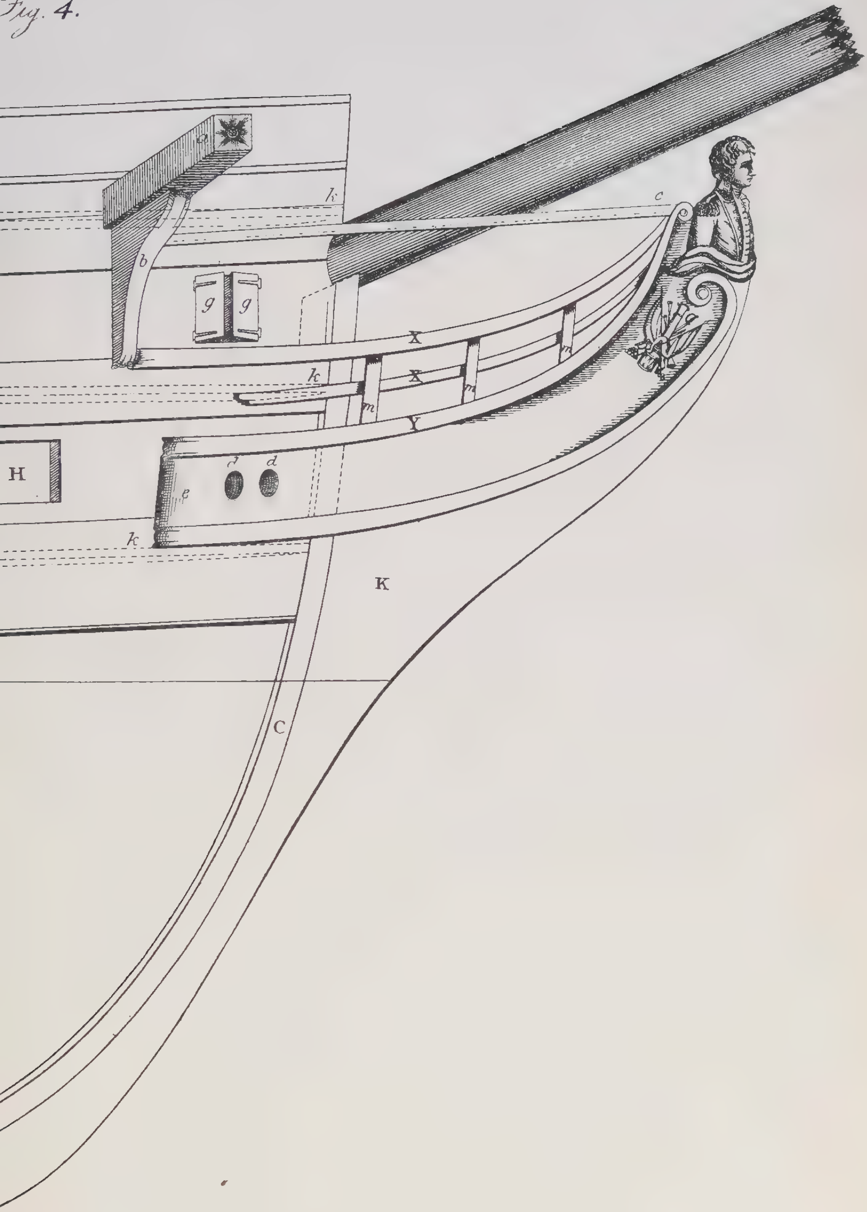


Plate V.

Fig. 4.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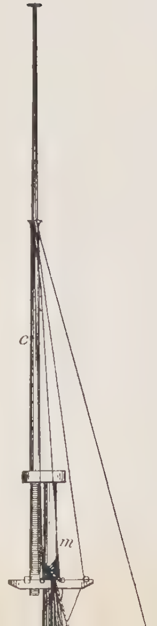

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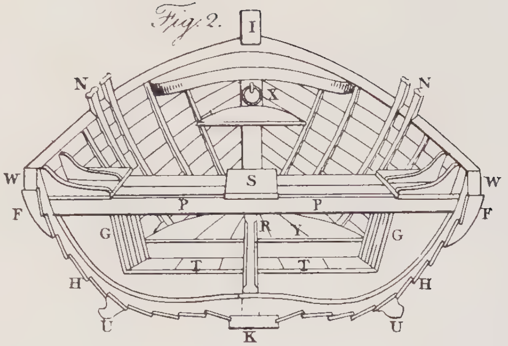
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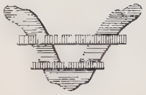
Fig. 3.



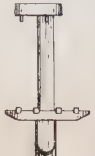


Fig. 7.

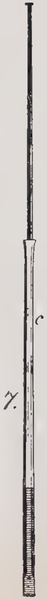
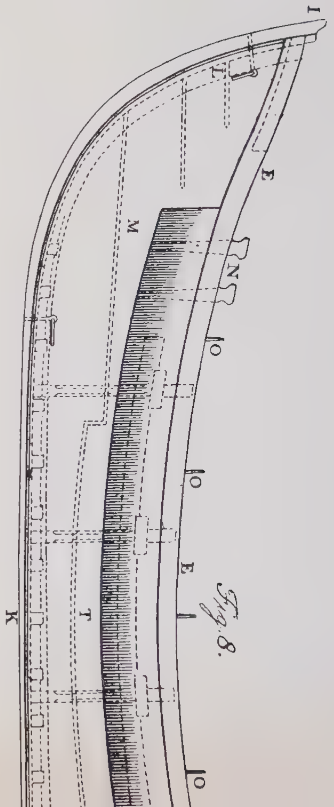


Fig. 8.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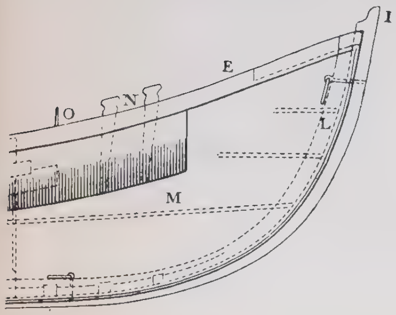
S

MASTS, RIGGING, TOP, LIFE-BOAT, etc.



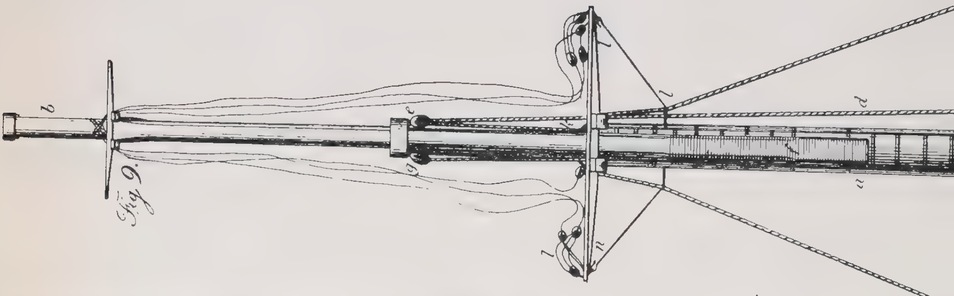


Fig. 9.

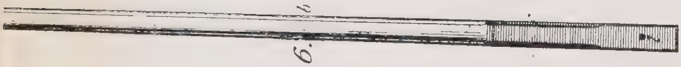


Fig. 6.

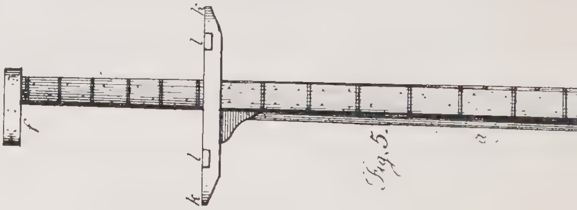
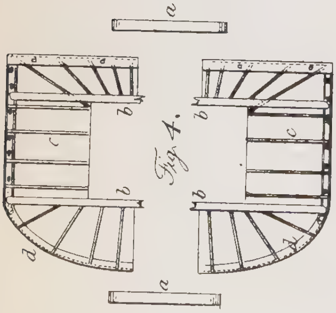


Fig. 5.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a

Fig. 4.

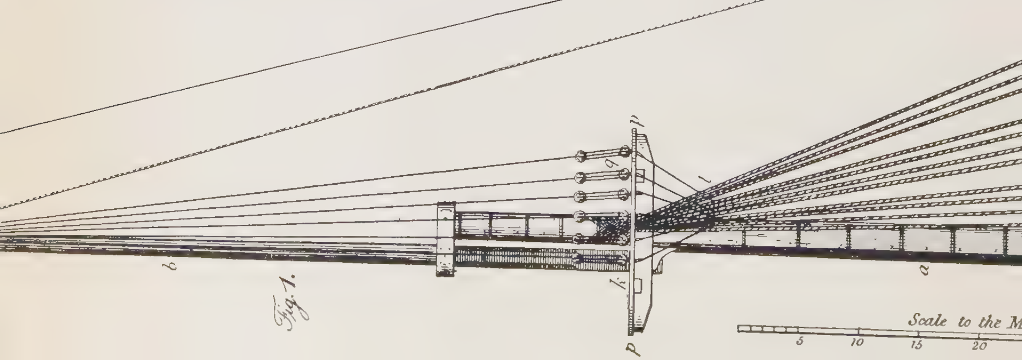
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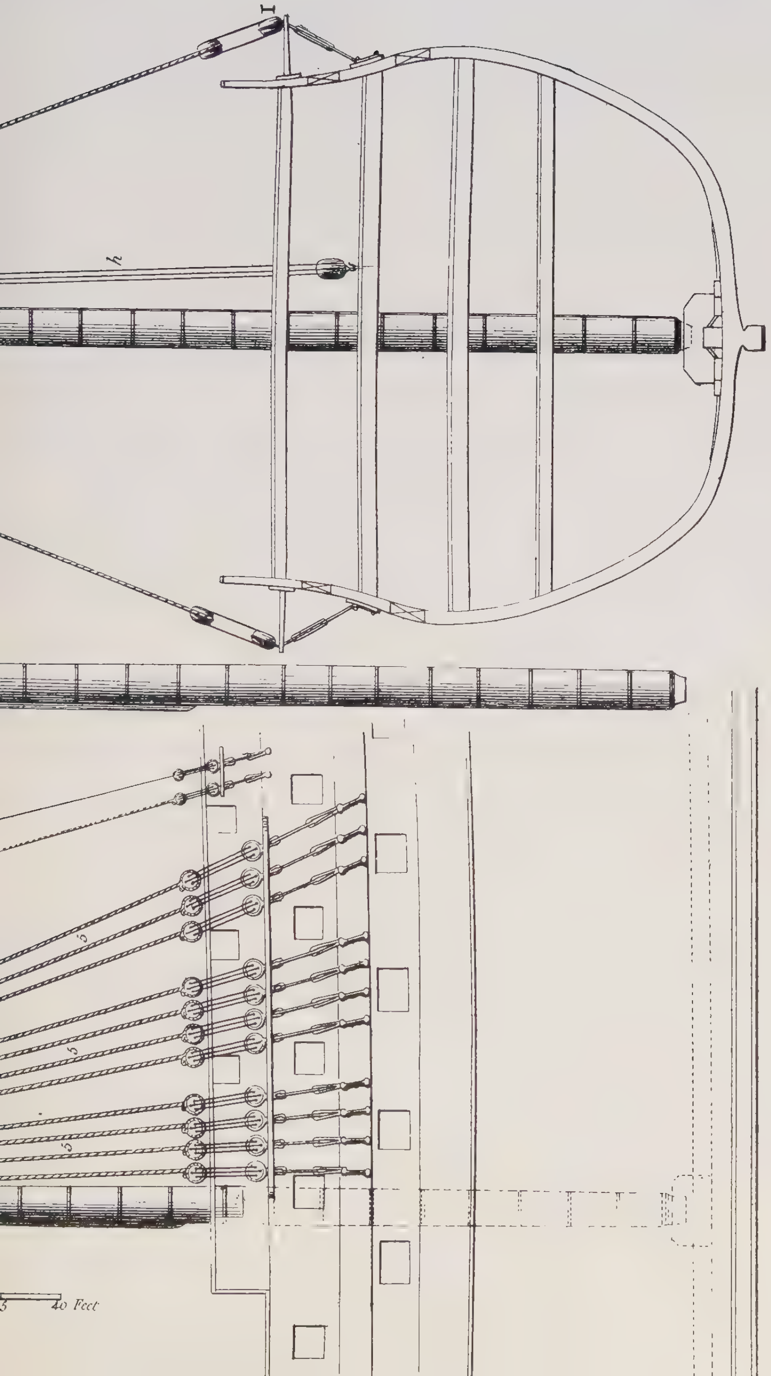
Fig. 1.

Scale to the M

Plate VI.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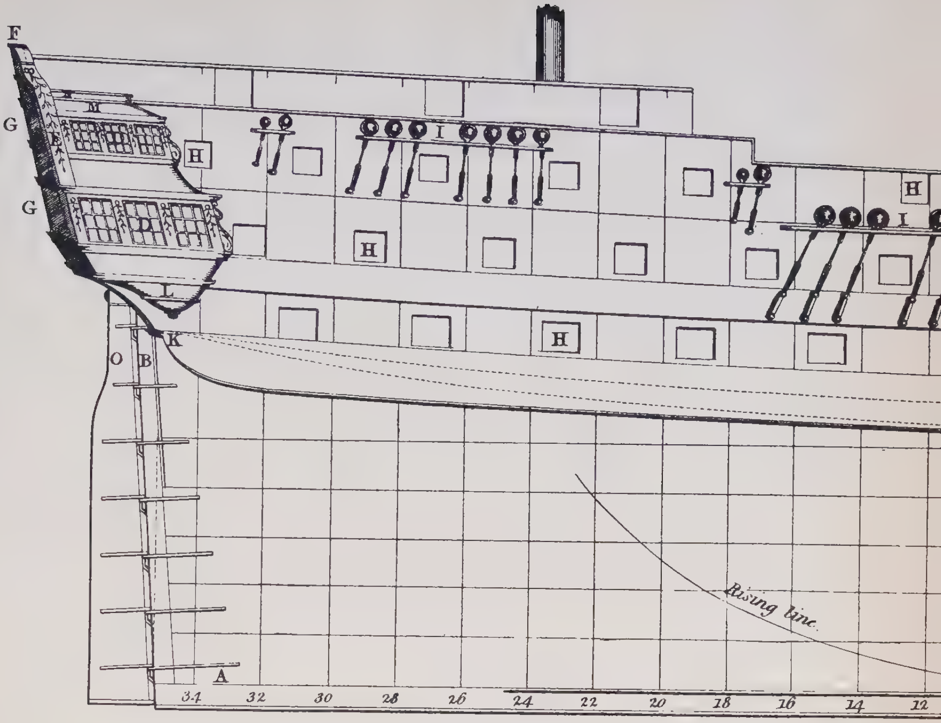
40 Feet


F
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Rising line.
34
32
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16
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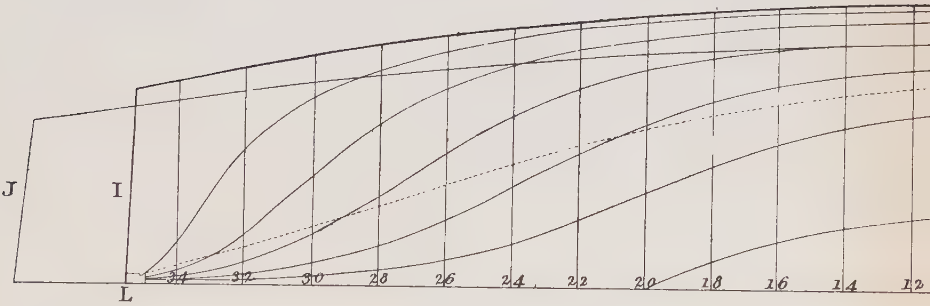
12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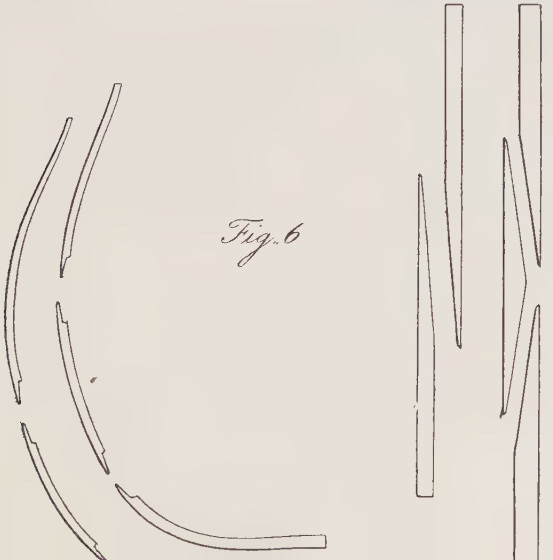


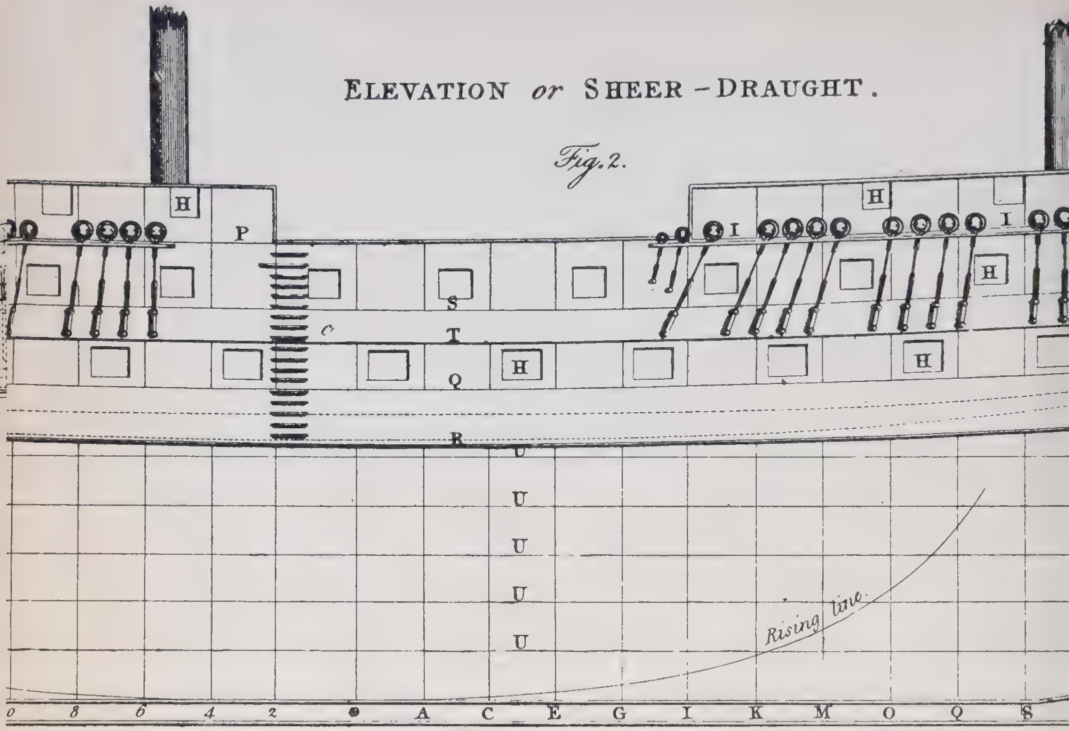
Fig. 6

A

PLAN AND ELEVATION OF A 74-GUN SHIP, etc.

ELEVATION *or* SHEER-DRAUGHT.

Fig. 2.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I
H
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S
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C
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H
R
U
U
U
U
U
Rising line
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4
2
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E
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K
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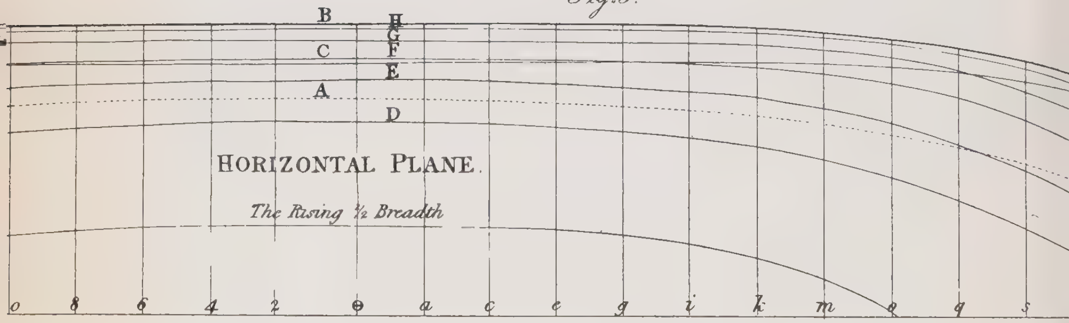
Fig. 3.


B
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G
C
F
E
A
D
HORIZONTAL PLANE.
The Rising ½ Breadth
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4
2
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q
s

Scale $\overline{16}$ of an inch to a Foot.

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5
10
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10
5
10
5
30

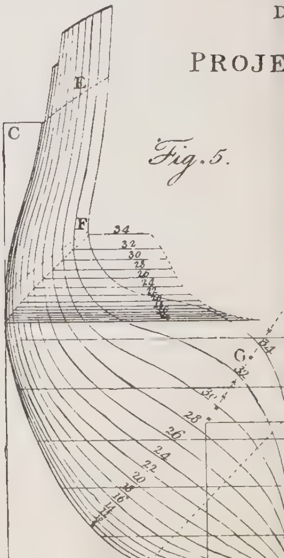
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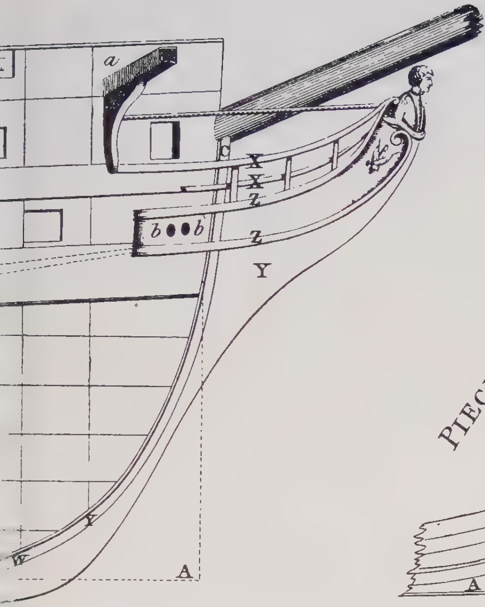
Fig. 5.

Plate VII.


a
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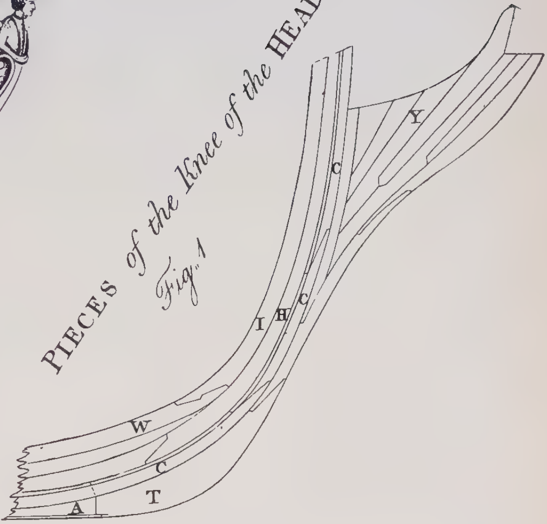
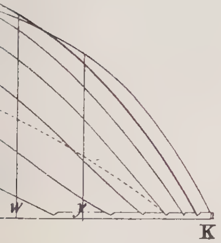
X
Z
Z
Y
Y
W
A

PIECES of the Knee of the HEAD, &c.

Fig. 1





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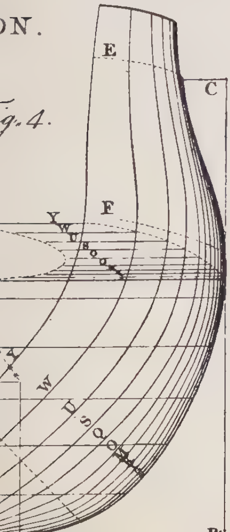
g. 4.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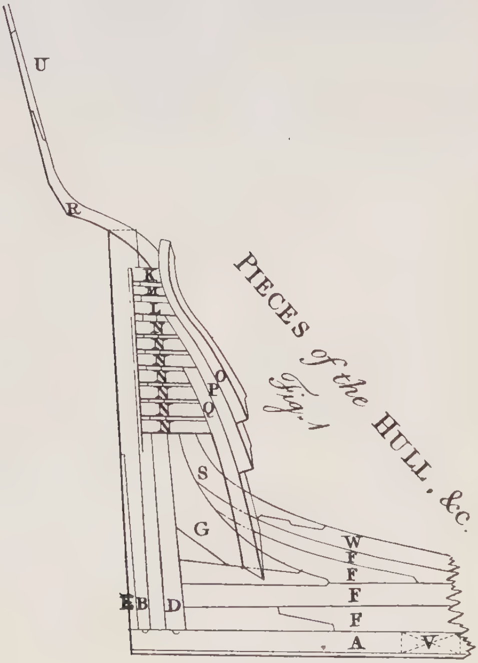
O

PIECES of the HULL, &c.

Fig. 1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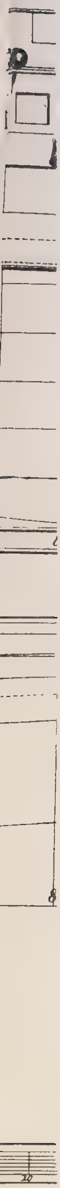
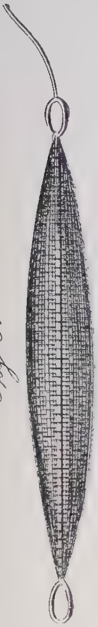

8
10

SAILS, SHROUDS, PAR



ig. 5.

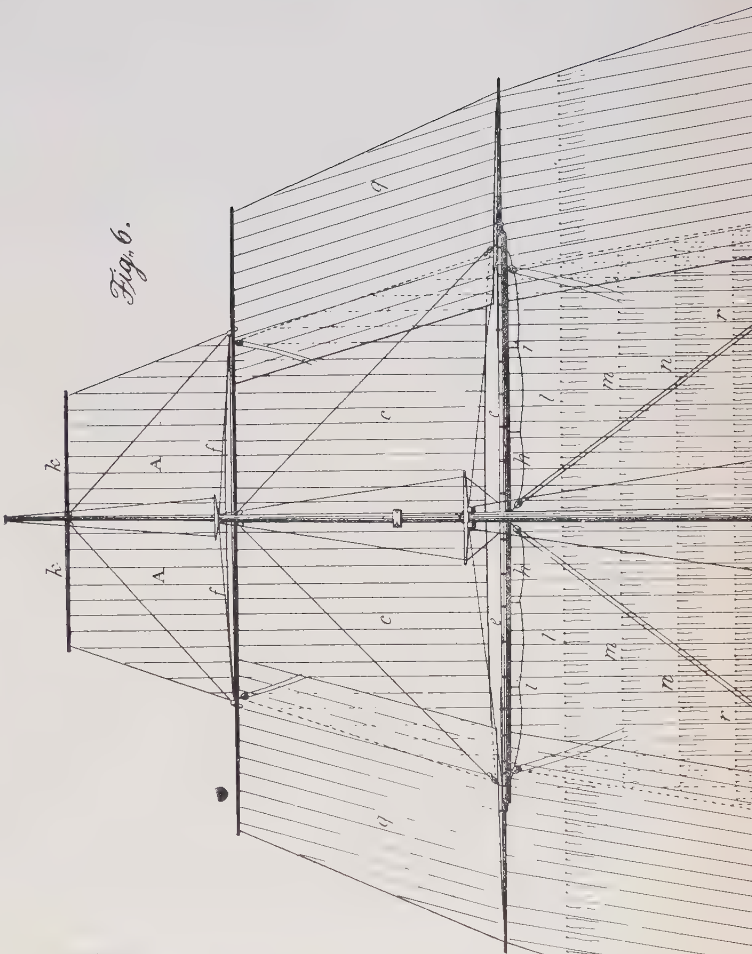


Fig. 6.

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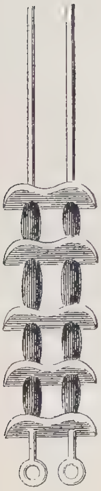
Fig 3

Fig. 2.



ig. 1.

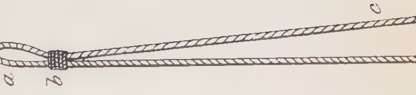
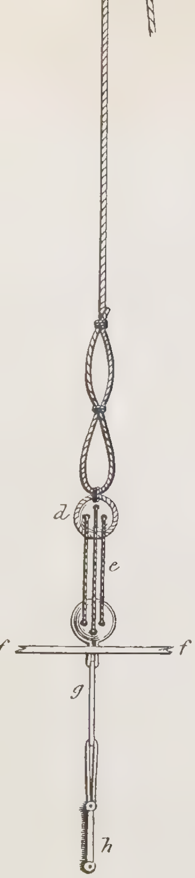
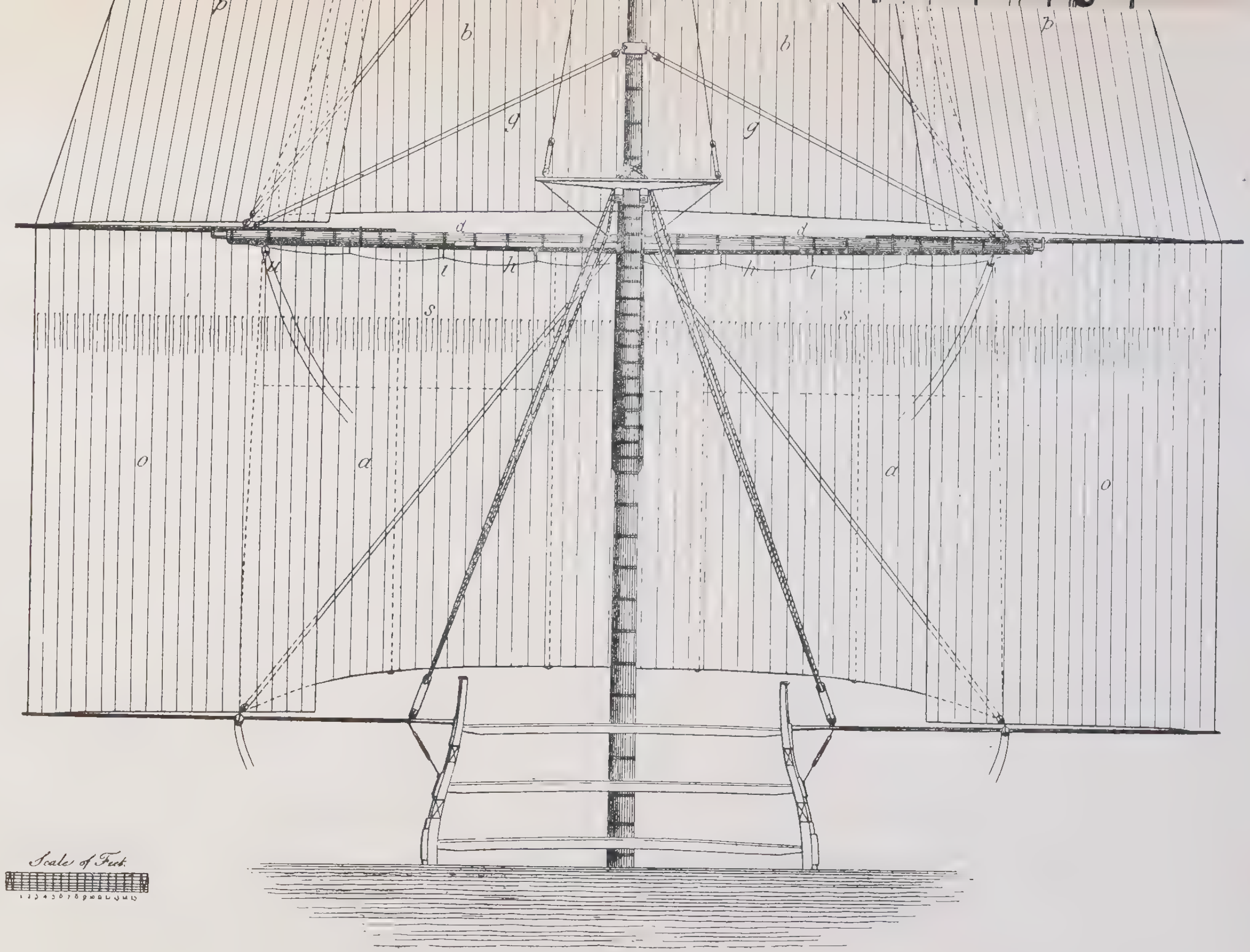


Fig. 4.

RAL, PUDDING, etc.

Plate VIII.




p
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Scale of Feet

AN EAST-IN

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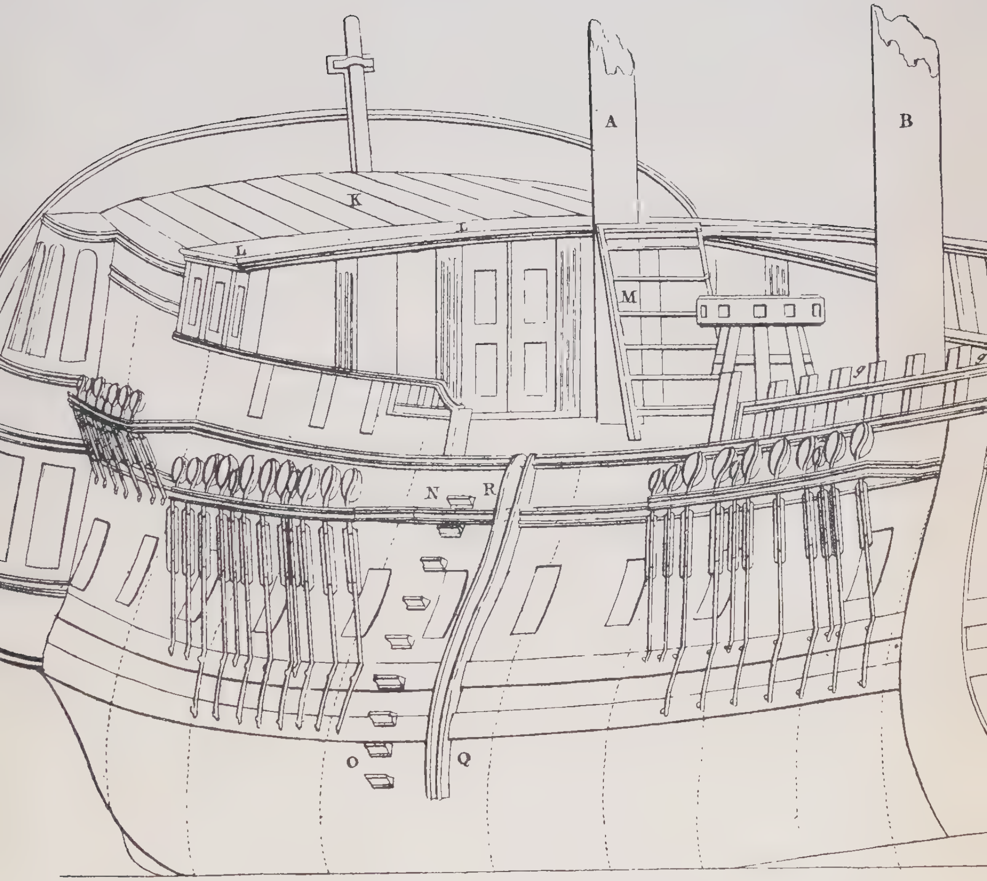
A
B
K
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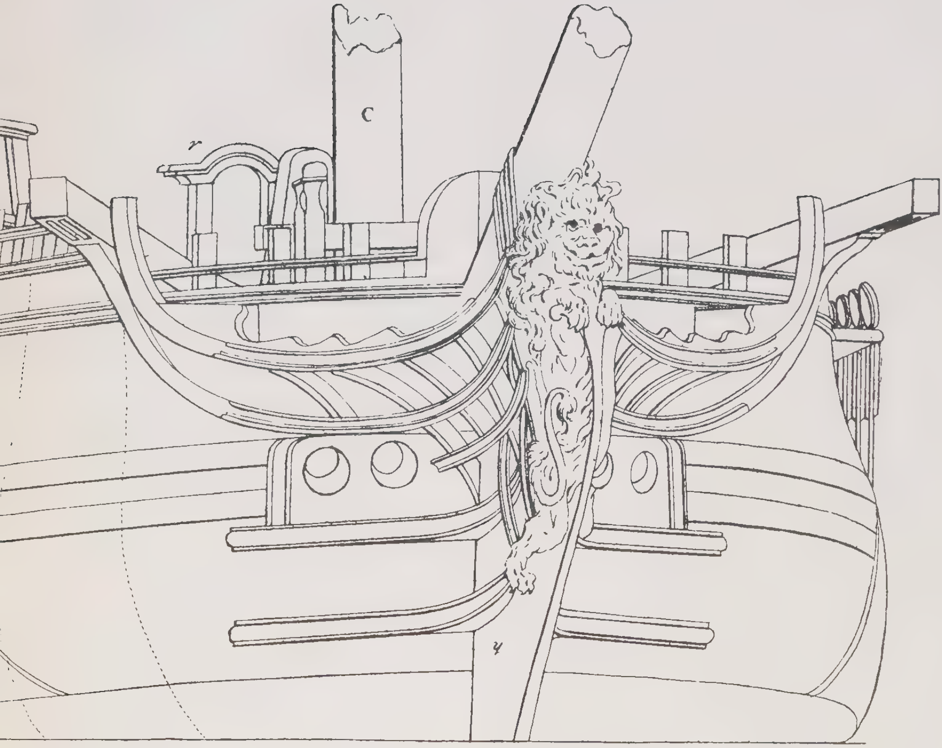
DIAMAN. **Plate IX.**

Dictionary, 1769).



FOREIGN-BUILT EA

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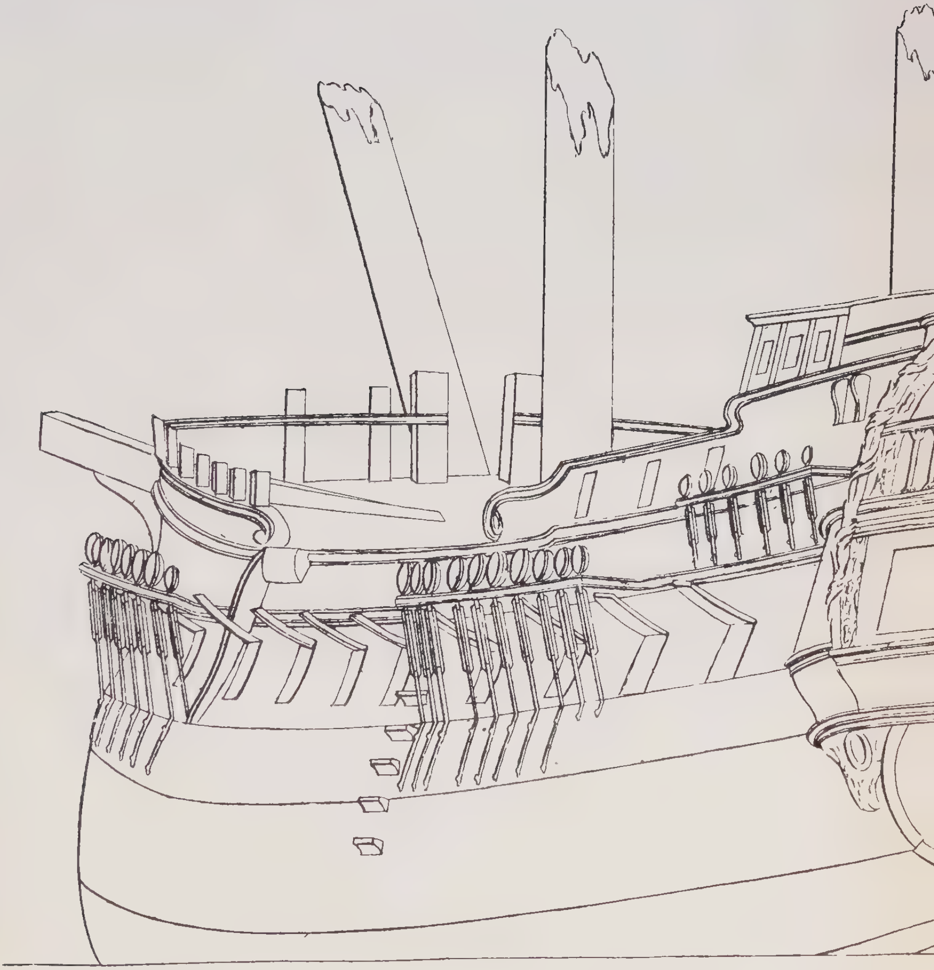
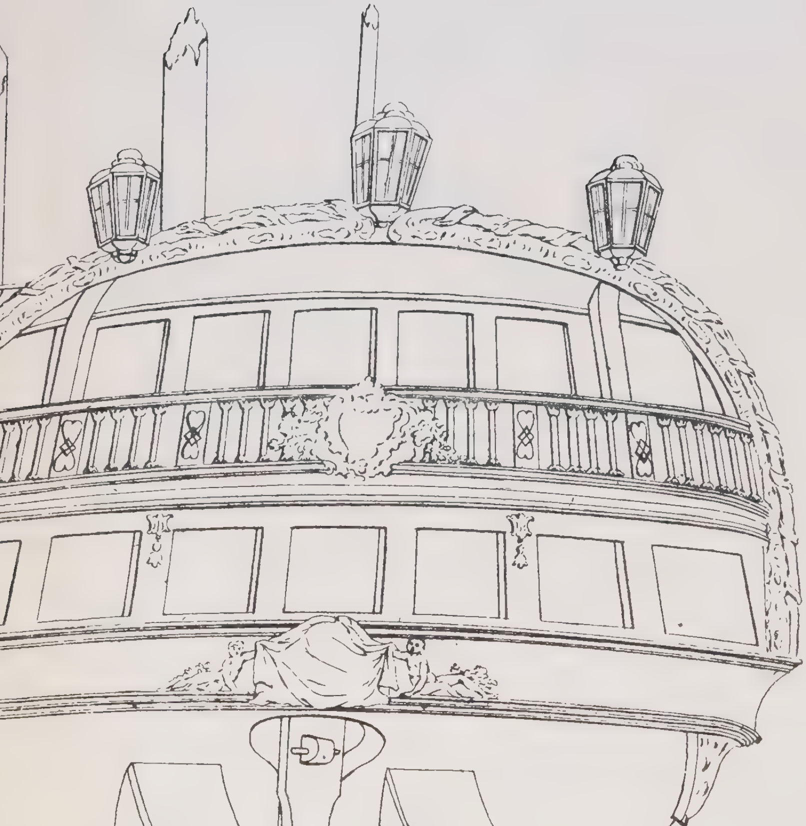


ST-INDIAMAN

Plate X.

Dictionary, 1769).



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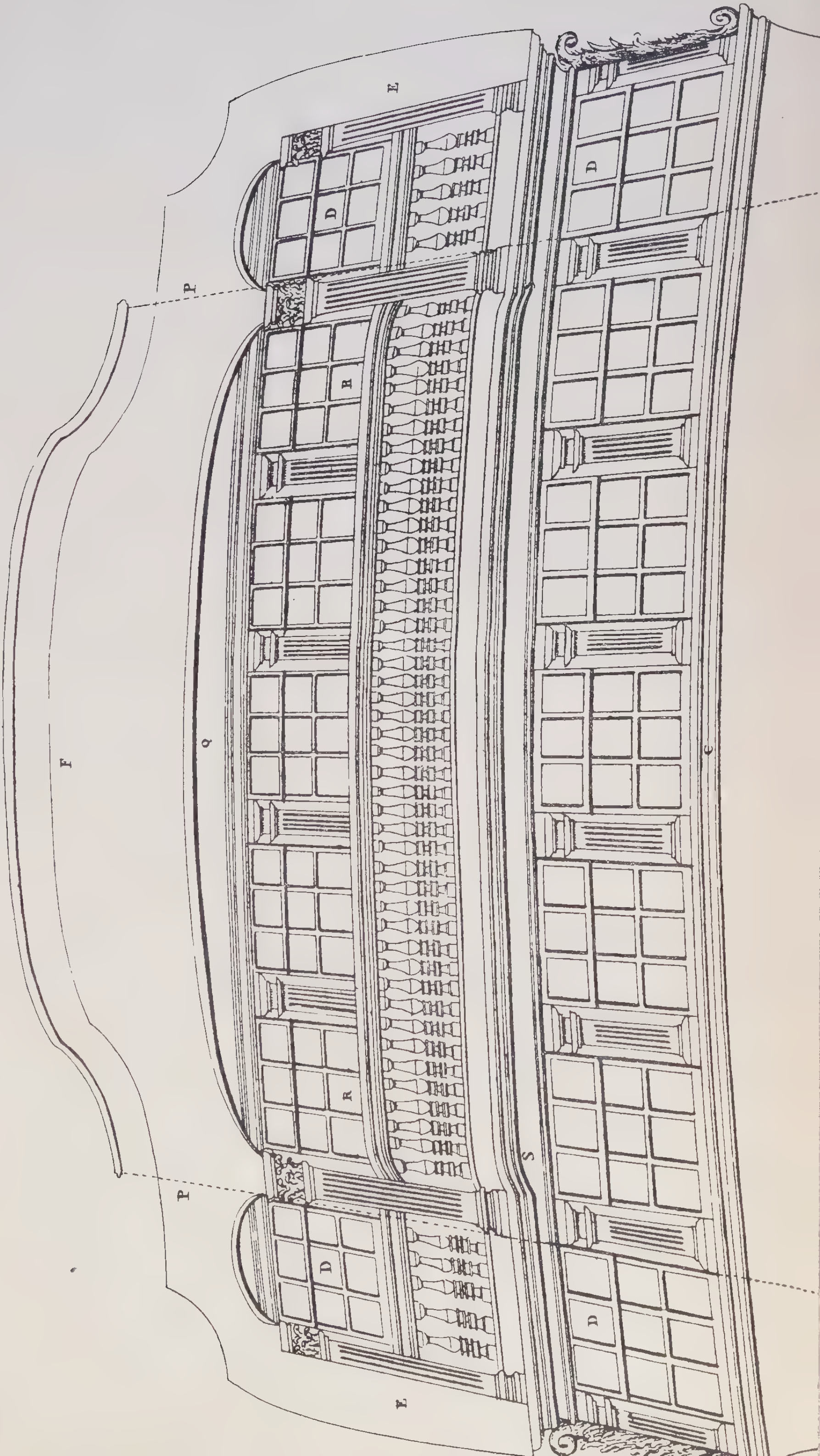
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UN SHIP
ctionary, 1769).

Plate XI.

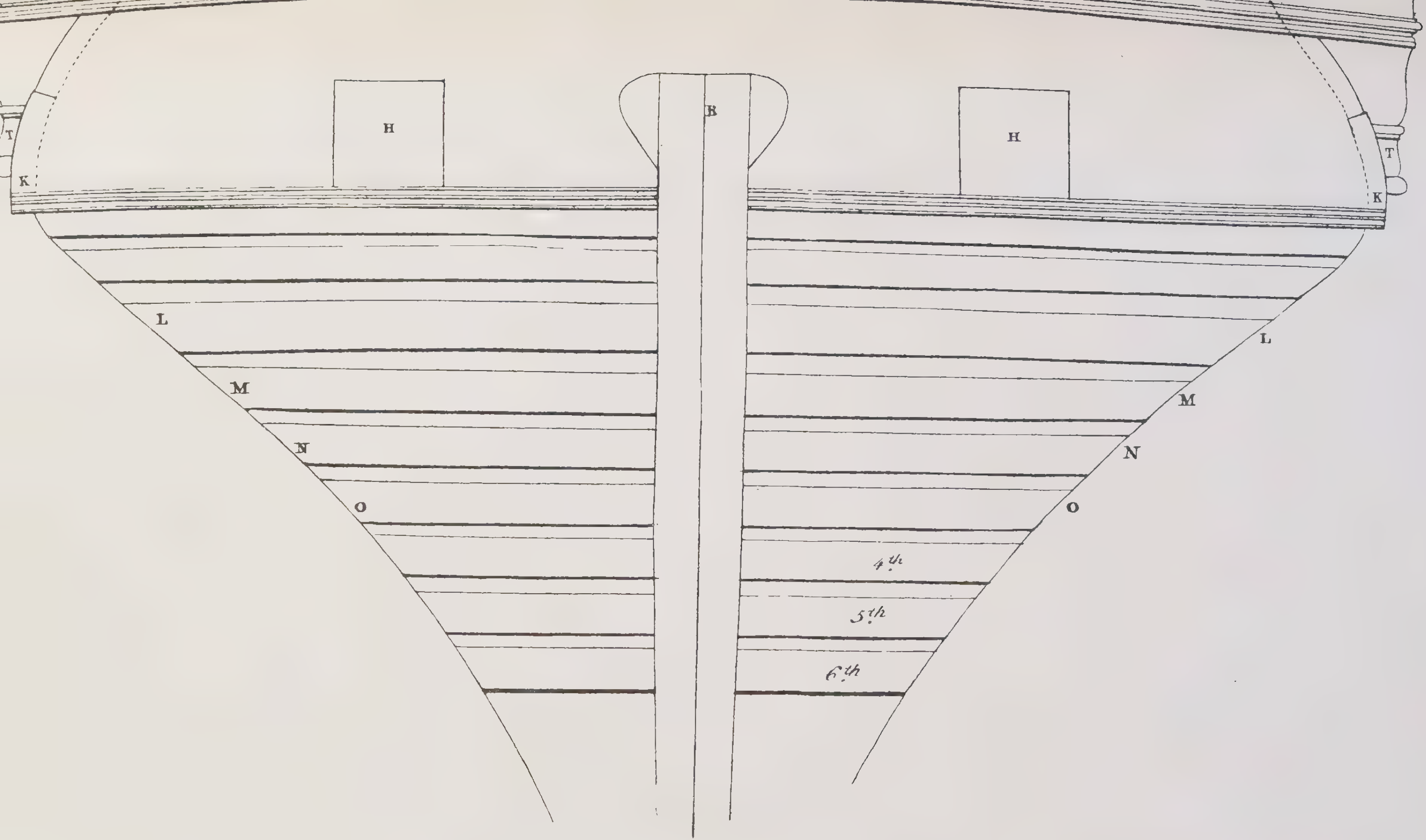
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Fig. 3.

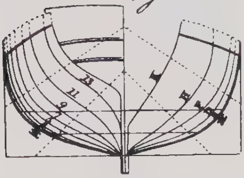

Fig. 1.

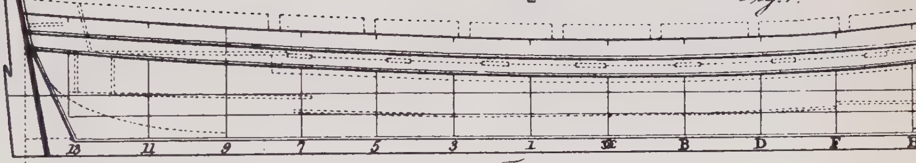
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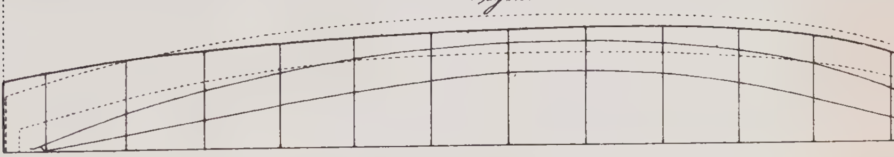
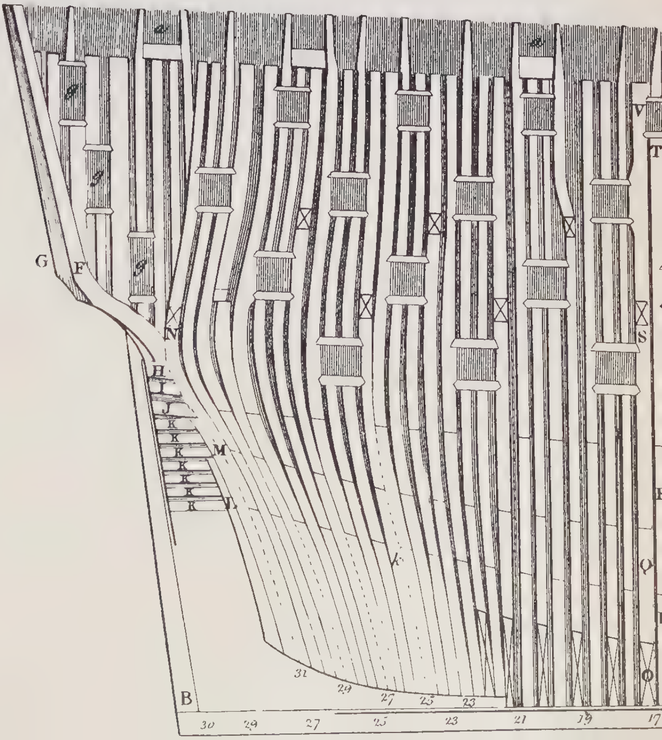
Fig. 2.

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TIMBERS OF A SECOND-RATE SHIP, BOATS, etc.

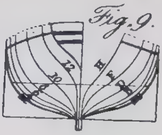

Fig. 9.

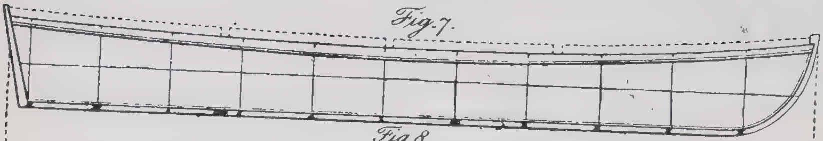

Fig. 7.

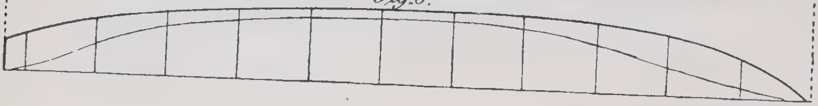

Fig. 8.

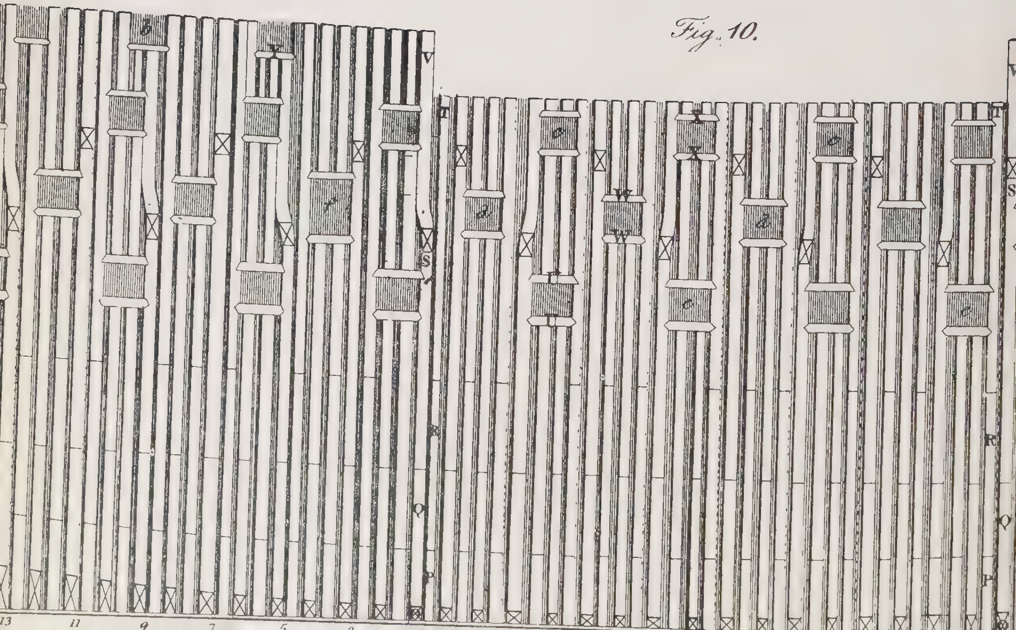
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Fig. 10.

Plate XII.

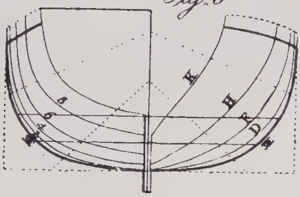
Fig. 6

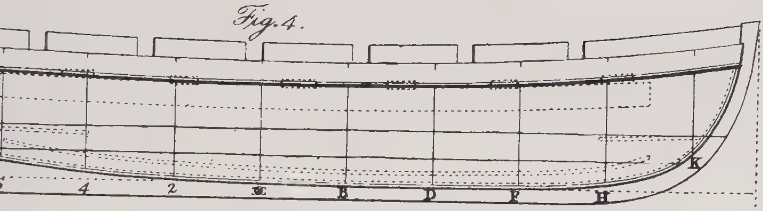
Fig. 4.

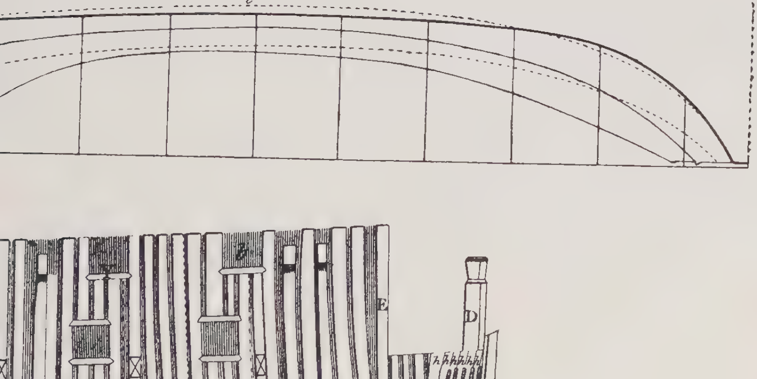
Fig. 5.

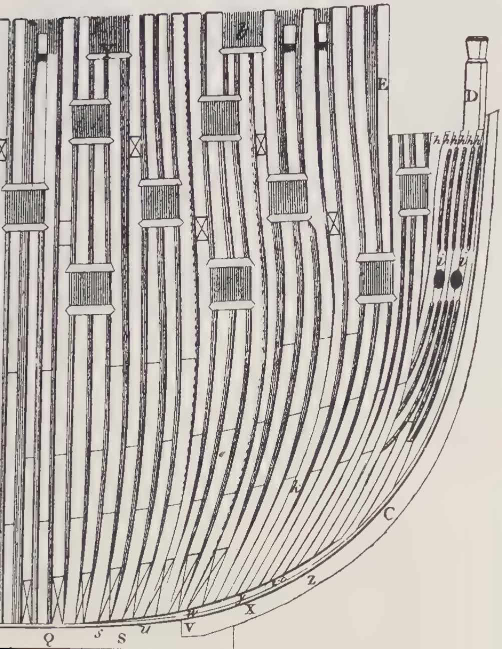
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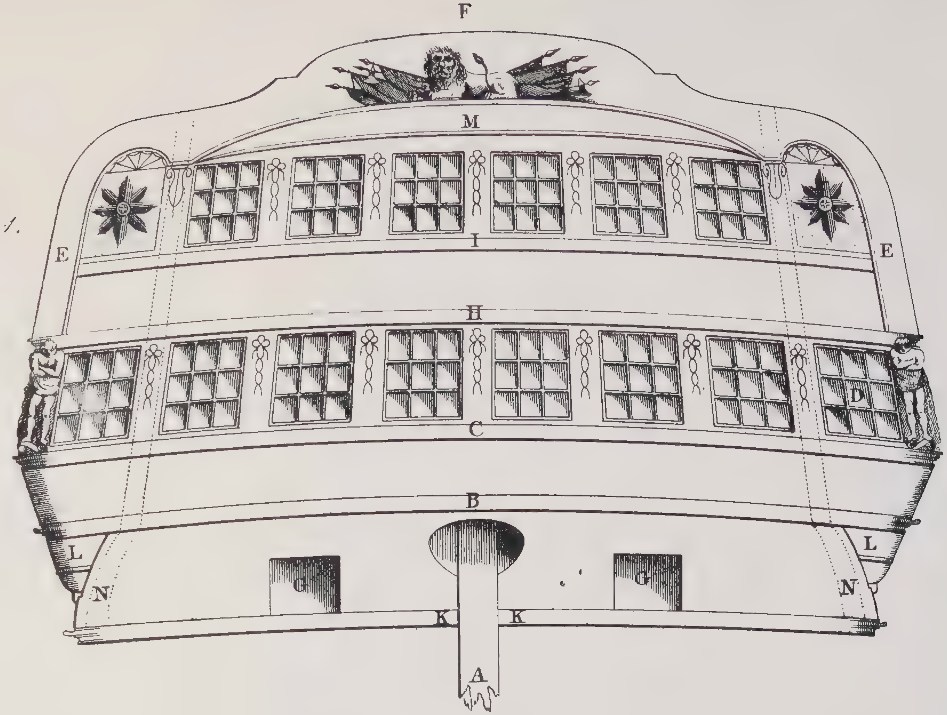
Fig. 1.


F
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ERN VIEWS OF SHIPS, TIMBERS OF A SMALL VESSEL.

(*Fig. 3, from the First Edition of the Dictionary, 1769*).

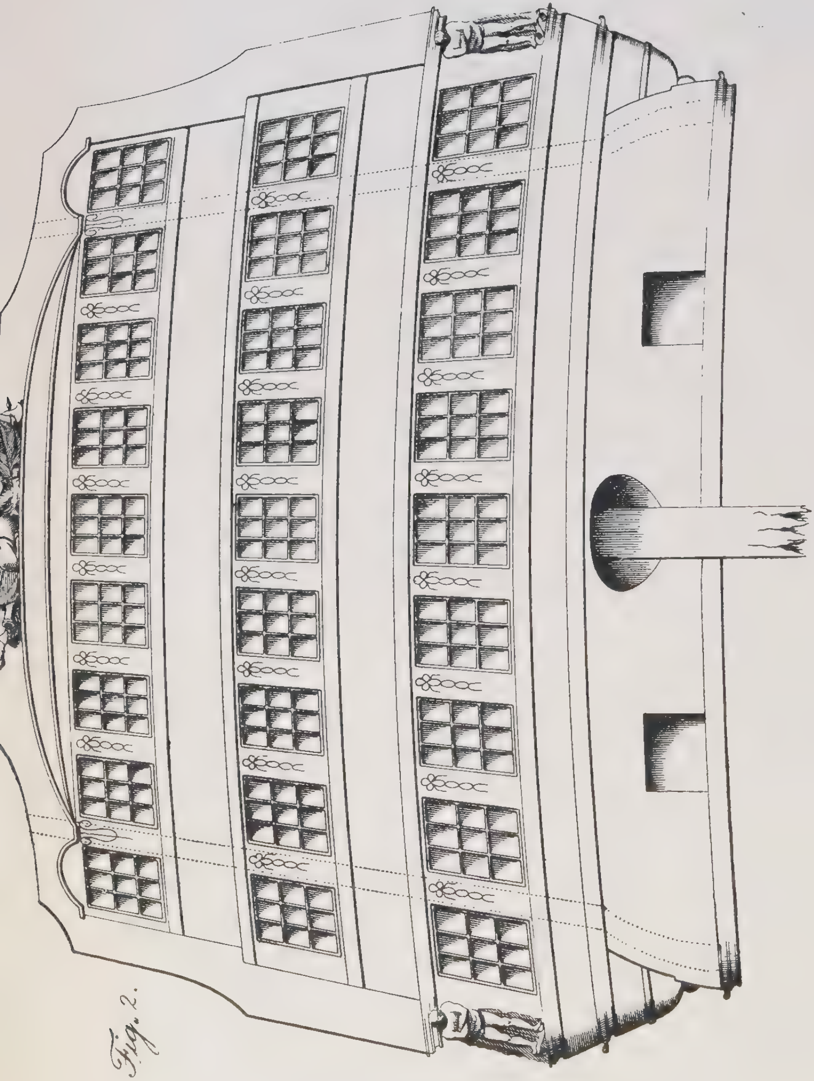
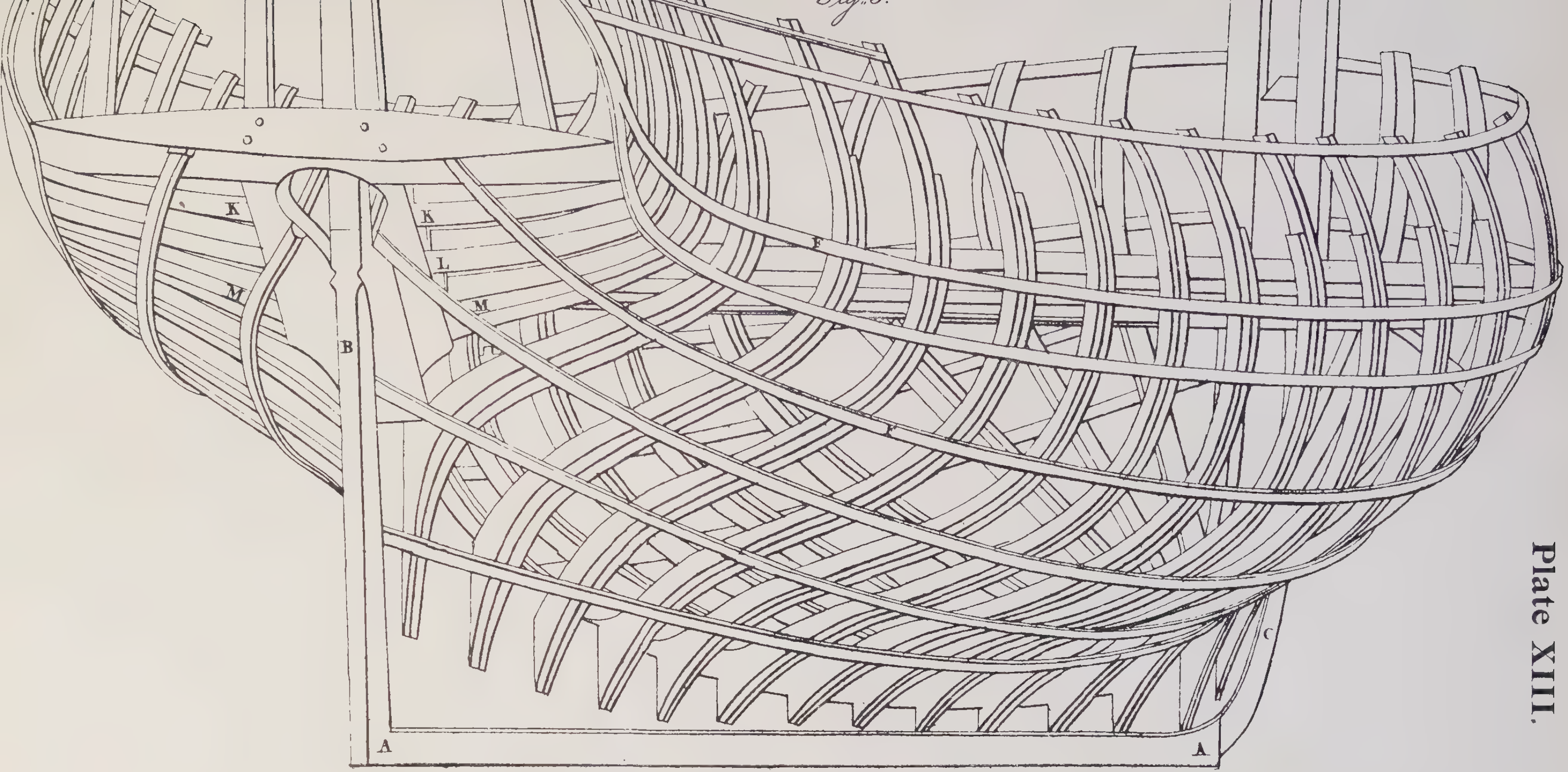


Fig. 2.

Plate XIII.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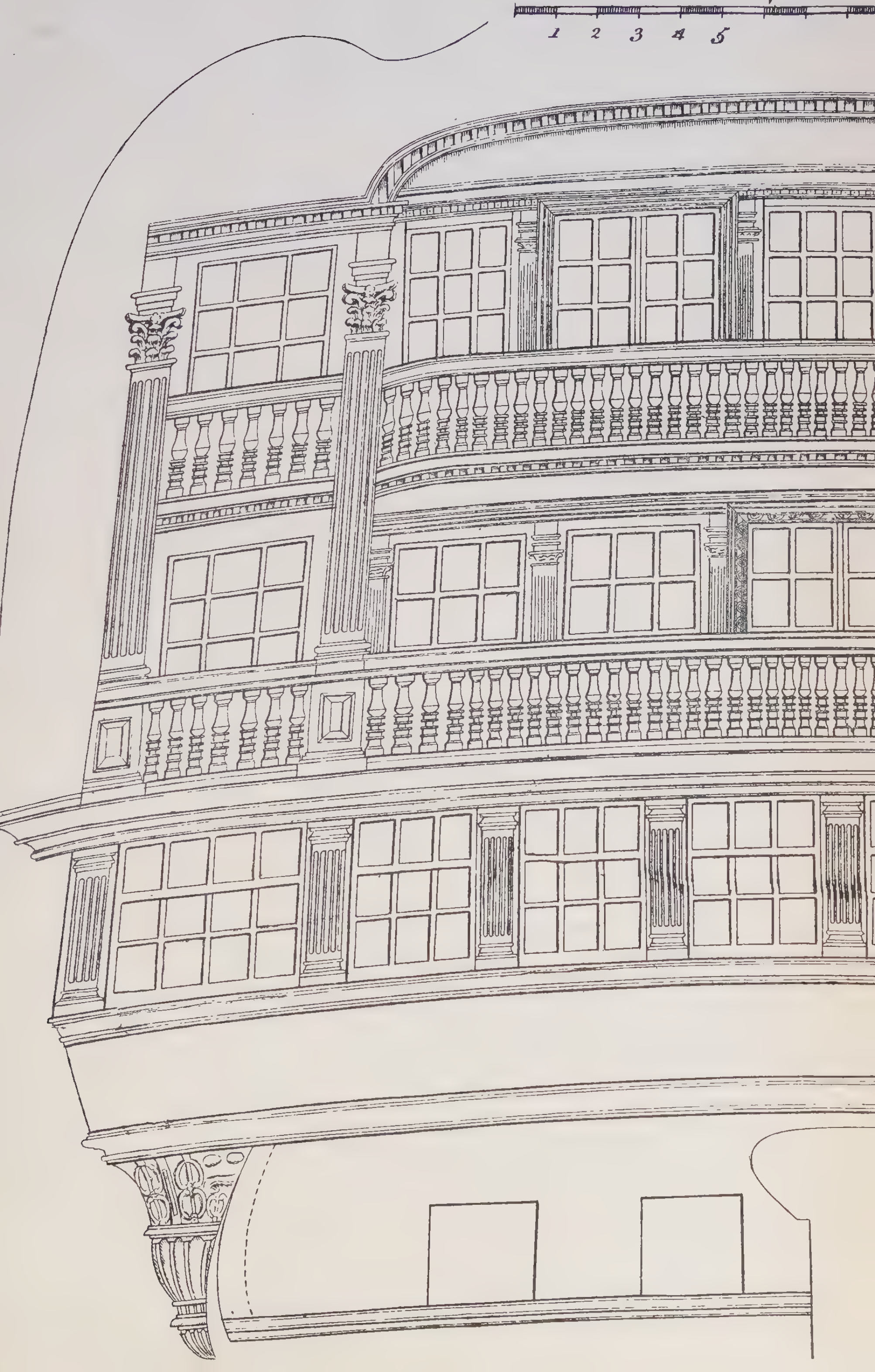
GEOMETRICAL ELEVATION OF THE ST

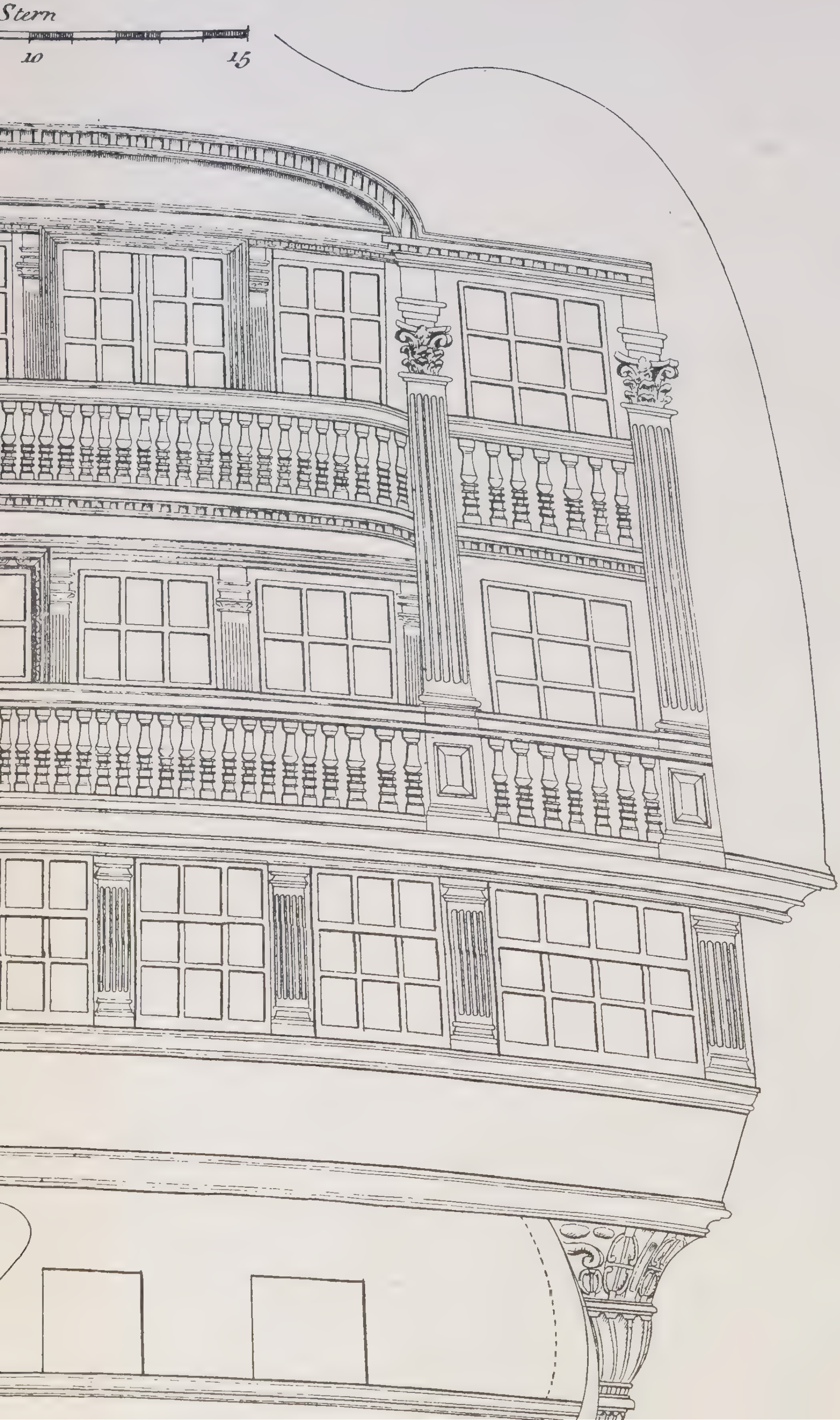
(From the First Edition of

Scale of Feet to

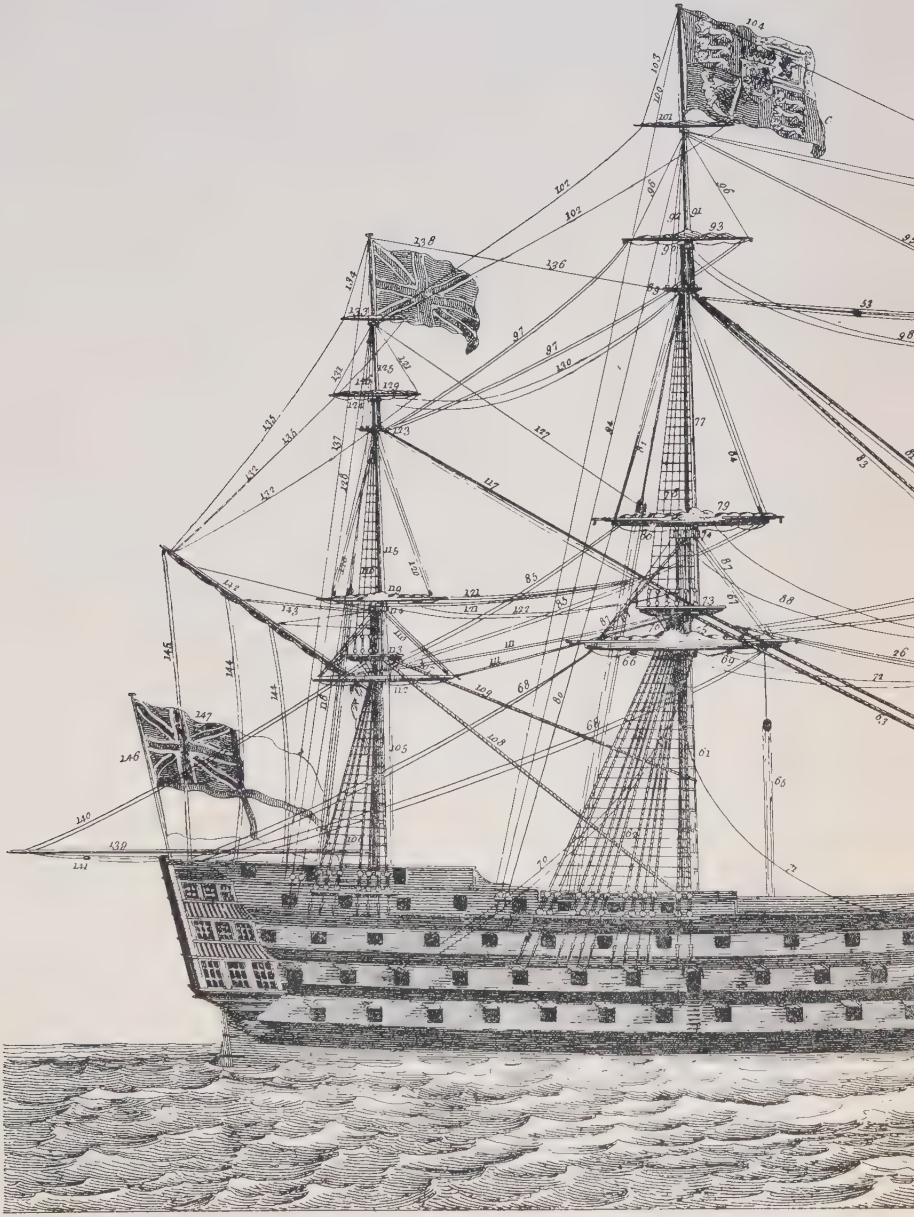


RN OF A FIRST OR SECOND-RATE   Plate XIV.

Dictionary, 1769).



A FIRST-RATE SHIP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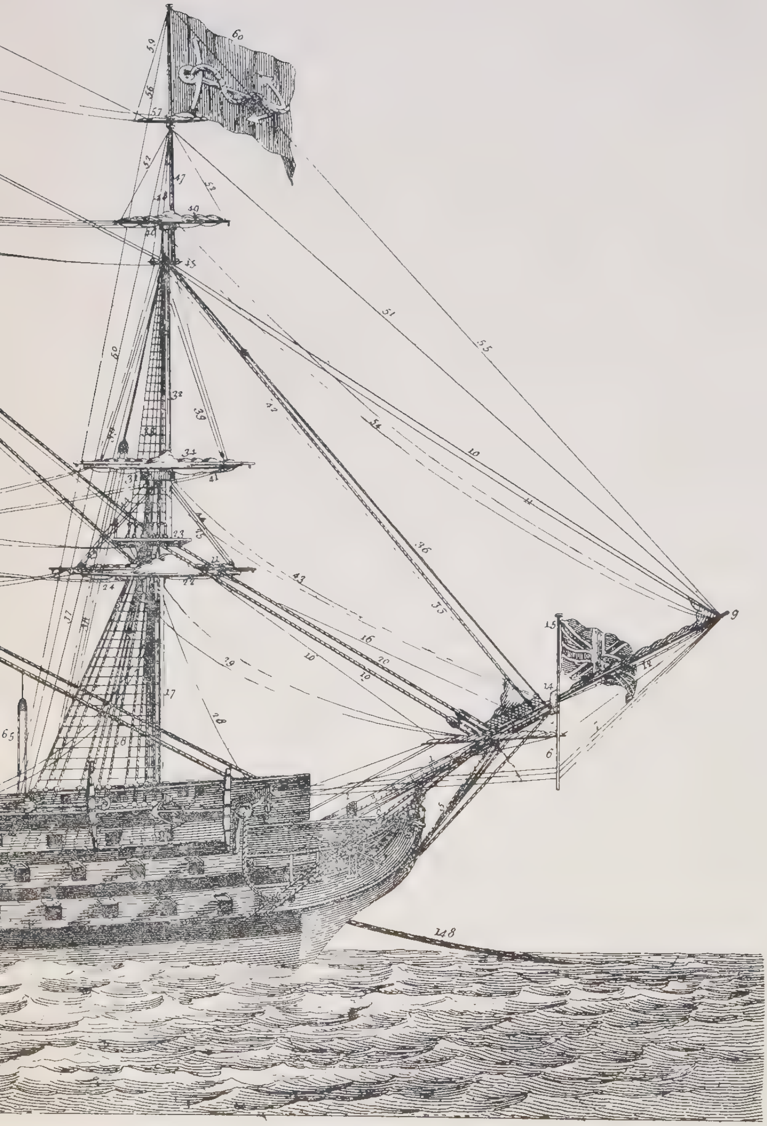
AT ANCHOR. **Plate XV.**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Sloop.

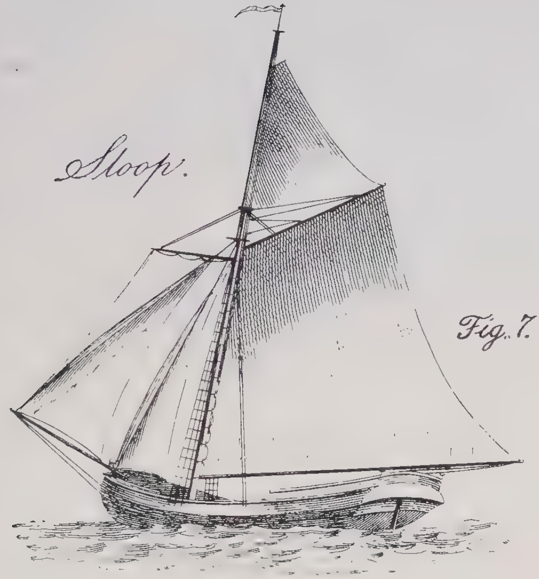


Fig. 7.

Cutter.

Fig. 6.

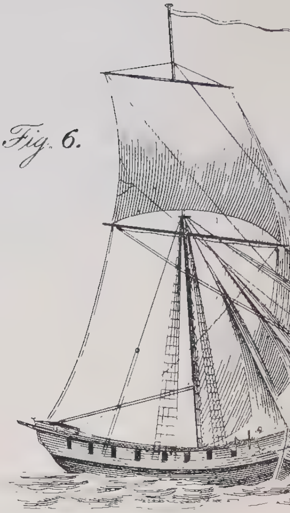
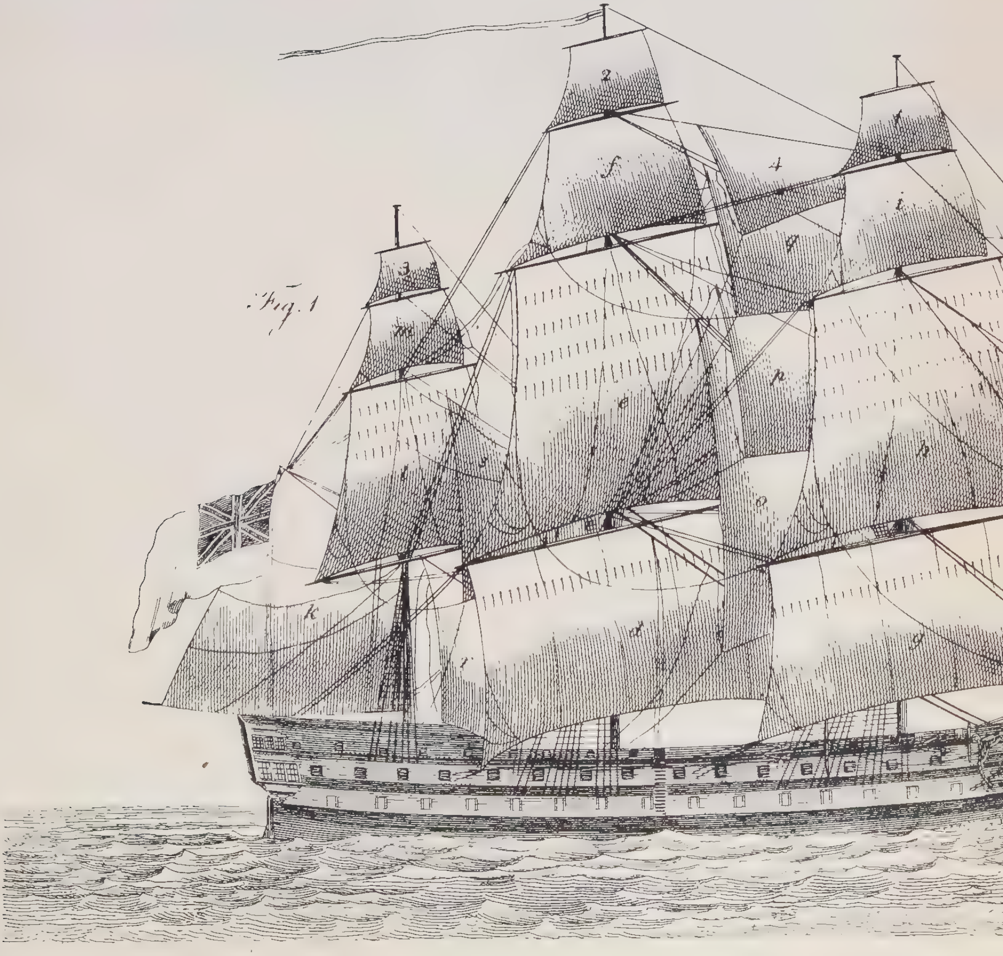


Fig. 1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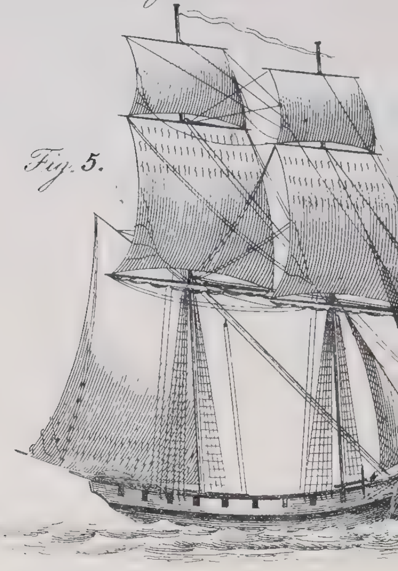
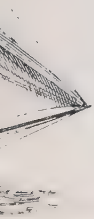
TYPES OF SAILING CRAFT.

Brigantine.

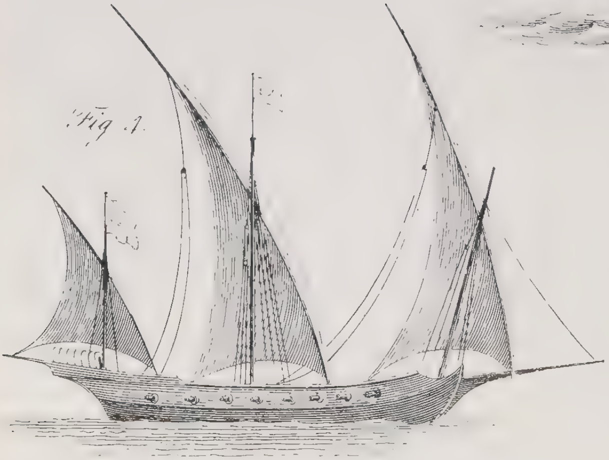
Fig. 5.

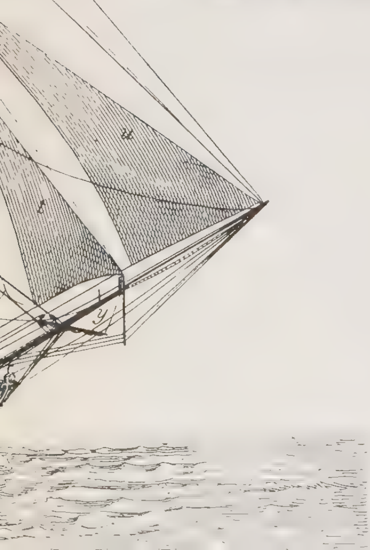




Xebec.

Fig. 4.





Lugger.

Fig. 2.

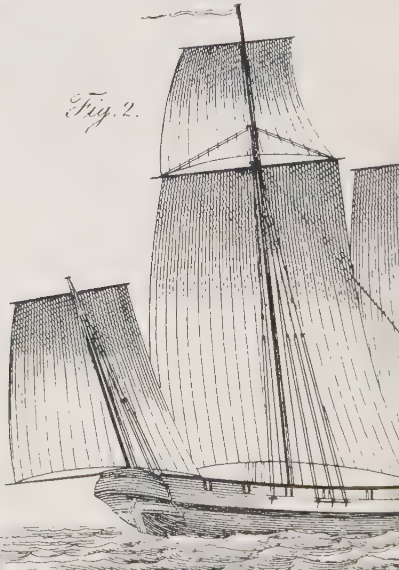


Plate XVI.

Yacht.

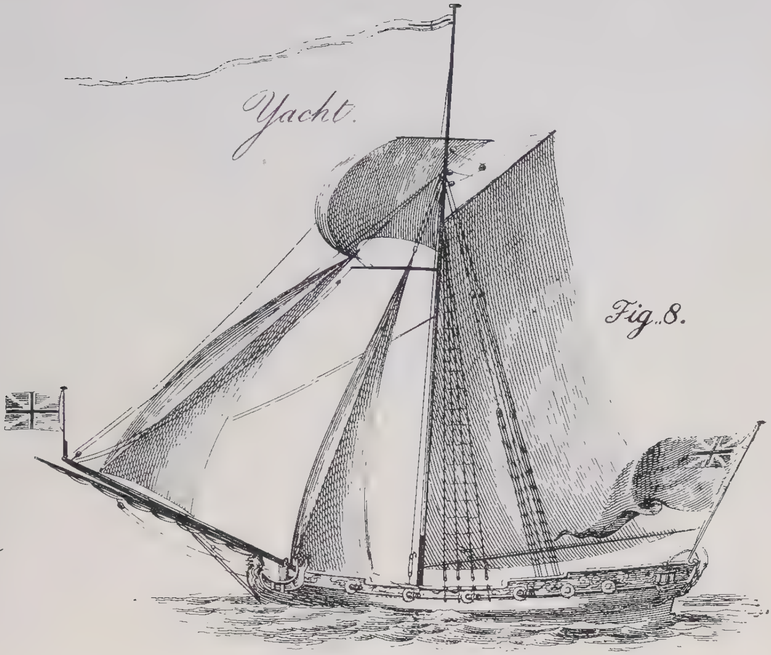
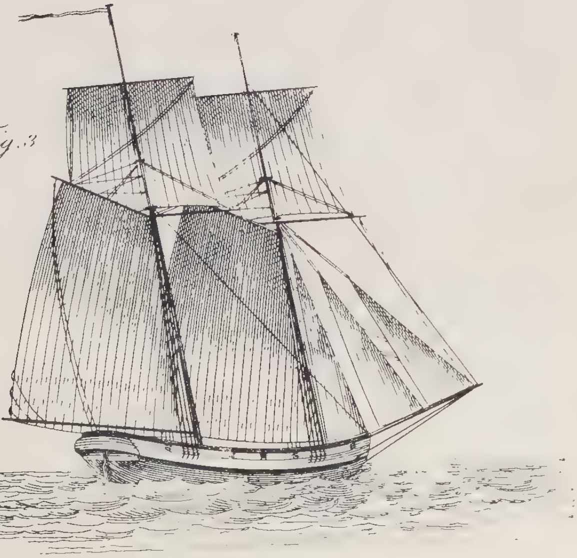


Fig. 8.

Schooner.

Fig. 3



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